ANNUAL CEMENT ISSUE

- Centralize Control of Rotary Kilns—New developments in instrumentation
- Possibilities of Automatic Kiln Control—A study of process characteristics
- Automatic Temperature Control of Rotary Kilns
- Centrifuge Steps Up Grinding Efficiency
- Adapting Control System to New Products
- Utilizing Idle Rotary Kilns in the War Effort.
- Blasting Rings from Rotary Kilns

ROCK PRODUCTS

AUGUST 1943

THE INDUSTRY'S RECOGNIZED AUTHORITY

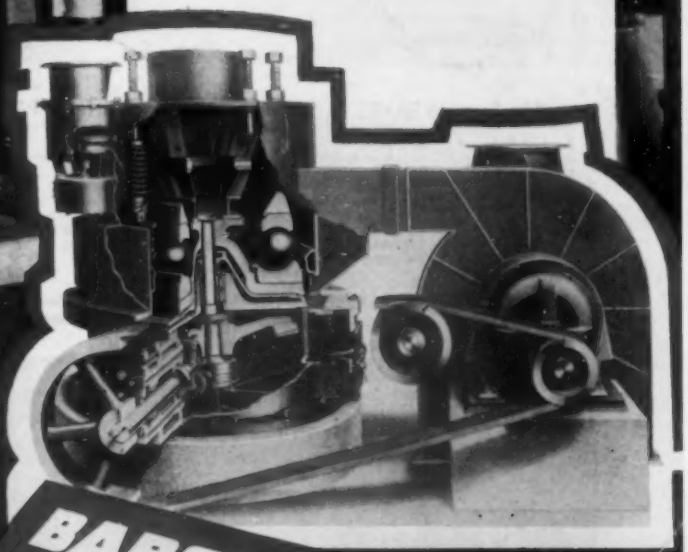
OVER 100,000 BBL. PER DAY

B&W PULVERIZERS
HELP CEMENT KILNS
REACH MAXIMUM OUTPUT

More than 100,000 barrels per day is the combined capacity of cement kilns using this Type E Babcock & Wilcox Pulverizer for direct-fired rotary kilns.

B&W Pulverizers, with a high availability record, are aiding cement men in meeting production goals.

THE BABCOCK & WILCOX COMPANY
85 LIBERTY ST., NEW YORK, N. Y.



BABCOCK & WILCOX

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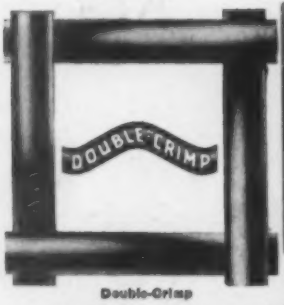
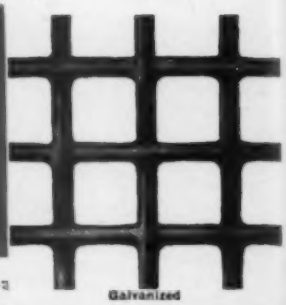


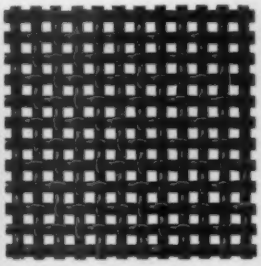
Double-Crimp

The "Perfect"

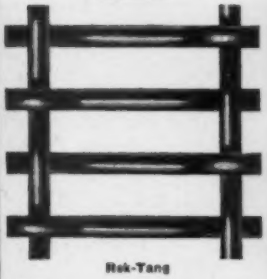
Wire Cloths and Screens

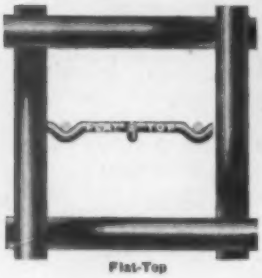

Galvanized

Arch-Crimp

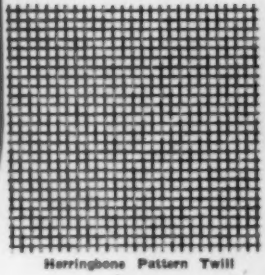

Calendered

Intermediate-Crimp


Rek-Tang



Flat-Top


Herringbone Pattern Twill

OF
SUPER-LOY, STEEL
GALVANIZED STEEL
STAINLESS STEEL
NICKEL-CHROME STEEL
PHOSPHOR BRONZE
BRASS
COPPER
MONEL
NICKEL
ALUMINUM

ANY SPECIAL METAL FOR ANY SERVICE

"Perfect" WEAVES

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Coiled
Double-Crimp
Double-Fill
Dutch
Flat-Top
Herringbone
Intermediate-Crimp
Rek-Tang
Selvage-Edge
Straight-Warp
Stranded
Sta-Tru
Triple-Warp
Twilled
Twisted-Fill
Twisted-Warp

"Perfect" PROCESSING

Arc-Welding
Bending
Binding
Brazing

Calendering
Coiling
Crimping

Cutting
Dipping
Dishing
Finishing
Flanging
Flattening
Forming
Framing

Galvanizing

Jointing
Knuckling
Painting
Rolling
Selvaging
Shaping

Shearing
Slitting
Soldering
Spot-Welding
Squaring
Stitching
Tack Welding
Trimming

"Perfect" PRODUCTS

Baskets
Circles
Coils
Cones
Cylinders
Discs
Forms
Leaves
Lengths
Panels
Pieces
Ribbons
Rings
Rolls
Sections
Segments
Strips
Templates

Illustrations show items listed in bold-face type. Other wire cloths and screens will be illustrated in subsequent advertisements of this series.

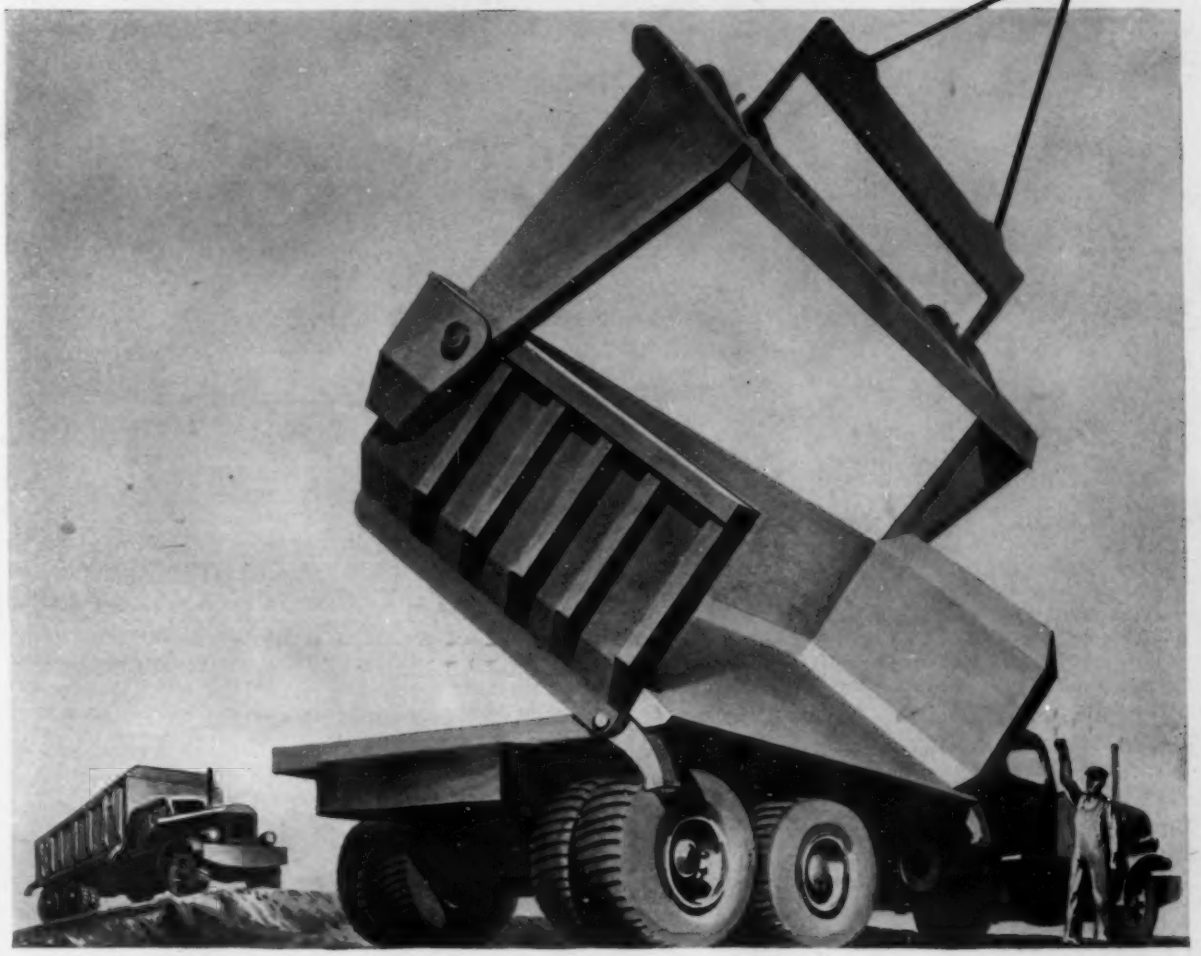
Sta-Tru

THE LUDLOW-SAYLOR WIRE CO.

ST. LOUIS, MISSOURI

COMING UP!

FOR YOUR CONSIDERATION



Make a note of this: EASTON has designed a new large capacity back-mounted body for open pit mining of iron ore. Six of these big side-dump Diesel-powered units will soon start hauling 30-ton loads uphill against a 10 percent grade.

An interesting feature is the dumping arrangement which our artist has visualized above. An EASTON overhead hoist is used. It works automatically by remote control. Two balanced hooks engage lift-bars on the side door. The door is raised until it is in a straight line with the hoisting cable. Then it becomes part of the bail for dumping and the body is raised to discharge position. While heavy chunks of ore might injure the operating mechanism of an automatic door, the simple arrangement used here lifts the door high out of harm's way and high enough to pass the largest piece of ore that might be loaded into the 16-yard body by the 4-yard shovel.

When the body is dumped, EASTON patented stabilizer feet, or outriggers, rest on the crusher-hopper wall. They absorb the shock and protect the truck chassis and springs from injury as the 30-ton load slides into the hopper.

Someday, perhaps sooner than you think, haulage is coming up for consideration at your operation. As demands increase, haulage routes lengthen, and old equipment completely outlives its usefulness, you'll want *more tonnage, faster, at lower cost.* That's why it will pay you, now, to consult EASTON and let our engineers make a free survey of your requirements. If you need, right now, new equipment which is necessary to *your* war effort, let EASTON help you to cut through Washington red tape and get it. Write to: Engineering Counsel, Easton Car & Construction Co., Easton, Pa. 8-1000

EASTON

INDUSTRIAL CARS
TRUCK BODIES · TRAILERS
ELECTRIC LIFT TRUCKS

WEBSTER SAYS:

"C comes through Latin from Greek, which took it from Phoenician."

GALIGHERS SAY:

"C is the type Geary-Jennings Sampler for CEMENT."

It is not just Coincidence that the Type C Geary-Jennings Sampler also automatically and accurately Cuts samples of streams of all Cement plant products, Construction materials, Coal, Coke, etC., including all types of dry, free-flowing materials to Check as to Conformity and Correctness.

Special explosion-proof or dust-proof Geary-Jennings Samplers are also available for special applications.

If you are interested in receiving full information please write us relative to material to be sampled advising:

1. Type and size of material
2. Width of stream
3. Amount of material flowing in stream
4. Percentage or amount of desired sample
5. Electrical characteristics

A prompt quotation will be sent you

Request Sampler Bulletin No. 411

THE GALIGHER COMPANY

48 South 2nd East

SALT LAKE CITY, UTAH

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Rock Products is published monthly by Tradepress Publishing Corporation, 309 West Jackson Blvd., Chicago 6, Illinois; Horace T. Hunter, President; John R. Thompson, Vice-President and Treasurer; J. L. Frazier, Secretary. Copyrighted 1943. Entered as second-class matter, Jan. 30, 1936, at the Chicago, Ill., post office under the act of March 3, 1879.

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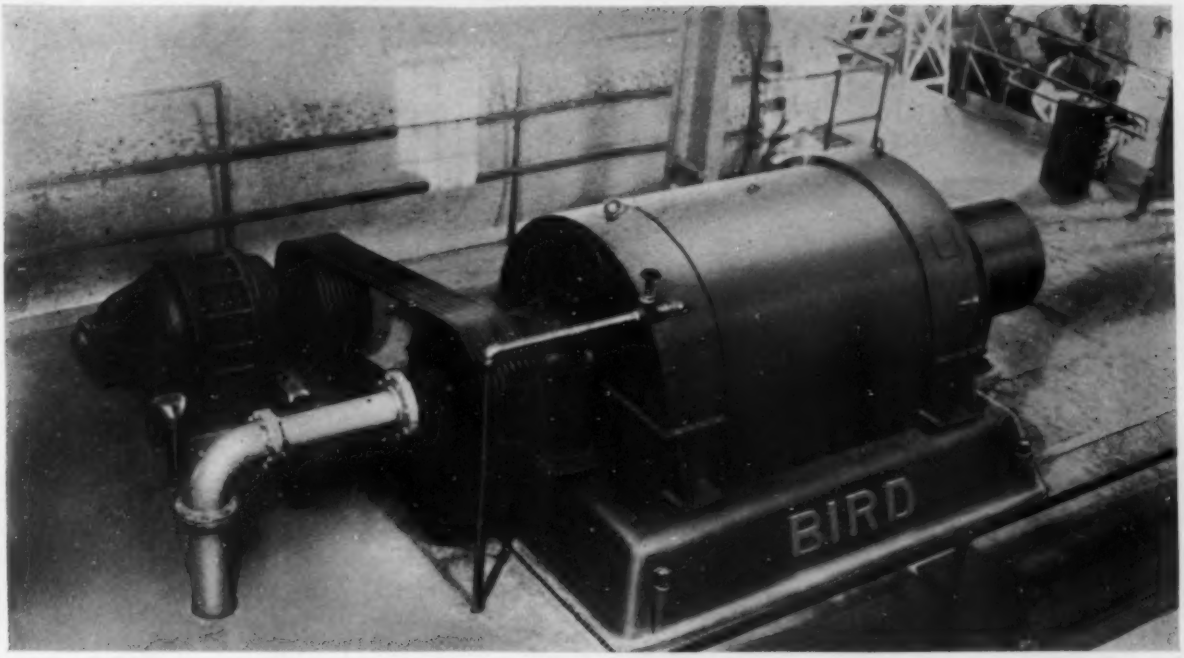

WHAT CAN A BIRD LIKE THIS DO FOR YOU?

In wet cement mills Bird Classifiers are producing results not previously obtainable. Among these are:

1. Slurries are being classified at ball mill consistency,—the fines, with only slight variation in consistency, going direct to the kiln, — the oversize returned for regrinding.

2. Slurries of high solids content are being selectively classified so that the desired fraction can be treated in flotation process. Lime content in the unfloated fraction is increased appreciably.

3. Cement ingredients are being classified individually and benefits realized on each component material.

Bird Classifiers have proved themselves in the field. Maintenance and power costs are low — results consistent. Why not find out what the Bird Classifier can do for you?

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

BUILDERS OF BIRD CONTINUOUS CENTRIFUGAL FILTERS

TRY THIS!

And Prove for Yourself That BEMIS MULTI-WALL PAPER BAGS Have Extra Strength Needed For Wartime Storage and Shipping

Place two filled Bemis Multiwall Paper Shipping Bags so that they are supported only by their ends. Then continue to pile filled bags on top of them. (The stack will get pretty high before those Bemis Multiwalls give way!)

This unusual experiment will show you the extra toughness of Bemis Multiwalls which enables them to withstand the severe hardships of wartime handling.

Exacting quality control plus Bemis manufacturing methods maintain this extra strength factor in spite of wartime restrictions and raw material difficulties.

Take advantage of Bemis quality and service when you reorder. Samples will be sent for testing without obligation.

Photograph of actual test made at the Arthur Ruprecht Sand & Material Co., St. Louis, Mo.

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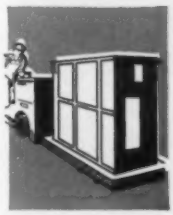
This CONSERVATION PLAN *will help you* SAVE MAN-HOURS... SAVE MATERIALS... SPEED PRODUCTION

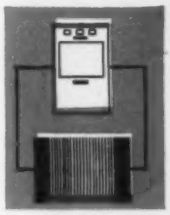


1. Conserve

by strategic selection, application and use of electrical equipment.

EXAMPLE

"Factory-packaged" equipment saves installation time and materials. An illustration of this is the Westinghouse "Power Center" which combines all transformer and switching equipment into one ready-to-use unit.



2. Conserve

by utilizing new developments that reduce need for critical materials and man-hours.

EXAMPLE

High-frequency heating reduces, by as much as 95%, the curing time required for producing thick plywood, plastics and other nonmetallic substances.

5. Conserve

by tapping all sources of salvageable scrap.

EXAMPLE

Systematic planning can uncover many ways of reclaiming worn equipment and waste material. Samples of salvage forms and organization charts in use in Westinghouse plants will gladly be made available on request.

3. Conserve

by utilizing available facilities for preventing breakdowns and reducing machine outages.

EXAMPLE

"Maintenance Hints"—a complete, pocket-size manual covering recommended upkeep practice for electrical apparatus—is a maintenance help available without charge. Check your Westinghouse representative for copies.

4. Conserve

by utilizing materials which in many cases can replace critical materials and do a better job.

EXAMPLE

Phos-Copper brazing alloy is easing bottlenecks created by a shortage of tin solders for joining metals. In some cases, one pound of Phos-Copper eliminates the need for as much as 12 pounds of tin.

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These five major points comprise a complete program developed by Westinghouse for Wartime Conservation. This program packages up Westinghouse engineering experience in the entire field of electric and power equipment and related materials. Examples noted are but five of many specific recommendations.

This experience and these recommendations are offered fully and without obligation.

Ask your Westinghouse representative today for a copy of the new 100-page book, "WARTIME CONSERVATION." Or write direct to Dept. 7-N, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. J-90482

Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

NEAR THE END OF A SHIFT—

A DRILLER OUT OF FORGED STEEL

WILL HE DO THIS

OR USE THIS

THE NEED FOR THIS DECISION NEED NOT ARISE WITH TIMKEN BITS.

Drillmen being human have the same weaknesses of all human beings. A driller using forged steels packs in no more than the number of steels he thinks he will need to complete a cut. But encountering tough drilling or steel becomes broken or plugged he finds he must stop drilling to search for more steels and carry them to the working face. Nearing the end of his shift, which after all is when shortages occur, his fatigue causes him to become "more human". He may elect to complete the day running dull drills, eventually finishing the round - - - at an enormous loss of efficiency. Even so there's some justification for his decision. If he must search for steel and pack it to his drill he realizes he will have little time left to sink holes before his shift goes off duty.

Timken Bits prevent these situations from arising. Carrying a few more Timken Bits than the maximum number needed imposes no burden - - - and every driller realizes it's to his advantage to do just that.

This is but one advantage of Timken Bits. We will demonstrate dozens of others. Write for complete details. The Timken Roller Bearing Company, Canton, Ohio.

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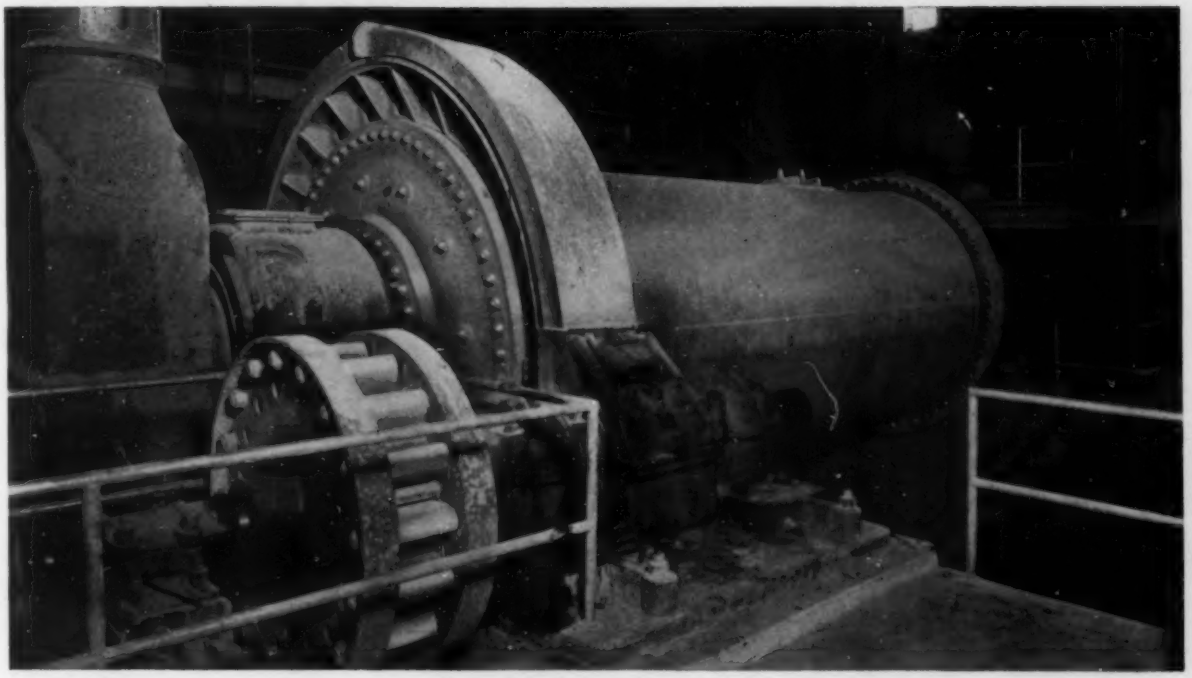

WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Sinkers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
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Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

THE SHELL OF THIS
TRAYLOR GRINDING MILL
IS IN ONE PIECE

The steel body or shell of this mill, like the shells of *all* Traylor Grinding Mills, whether of the ⅜" thickness of a wee 3'-0" x 3'-0" machine or of 1¼" plate used for the mighty 8'-0" dia. x 50'-0" Compartment Mill, is in one piece. The original welding technique developed by us fuses the edges of the individual plates in such manner that the joints actually are *stronger than the parent metal.* This makes for the strength and thorough reliability of the whole machine that are invaluable to operators.

This shell construction is only one of the many mechanical features of Traylor Grinding Mills that single them out in the crowd—the *building-in* of ideas of our engineers, based on their intimate knowledge of the work to be done, knowledge gained by incessant observation and study. To investigate Traylor Grinding Mills is to install—to install is to enjoy big profits and permanent satisfaction. Consult us!

P. S.—The shells of Traylor Rotary Kilns, Coolers and Dryers are built like this, too!

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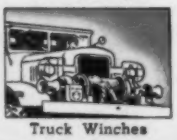
Truck Winches

The mightiest aggregation of fighting men, completely equipped with armament produced by the United Nations—and by industry in America—will provide unstoppable power for our fighting men on all fronts.

GW is in the war! Its products, "on all fronts," are geared to this gigantic thrust for freedom. 100% war production—that's been the GW status for a long time—in fact, Gar Wood Industries, Inc., was among the *first* group of manufacturers to convert all its production into war work.

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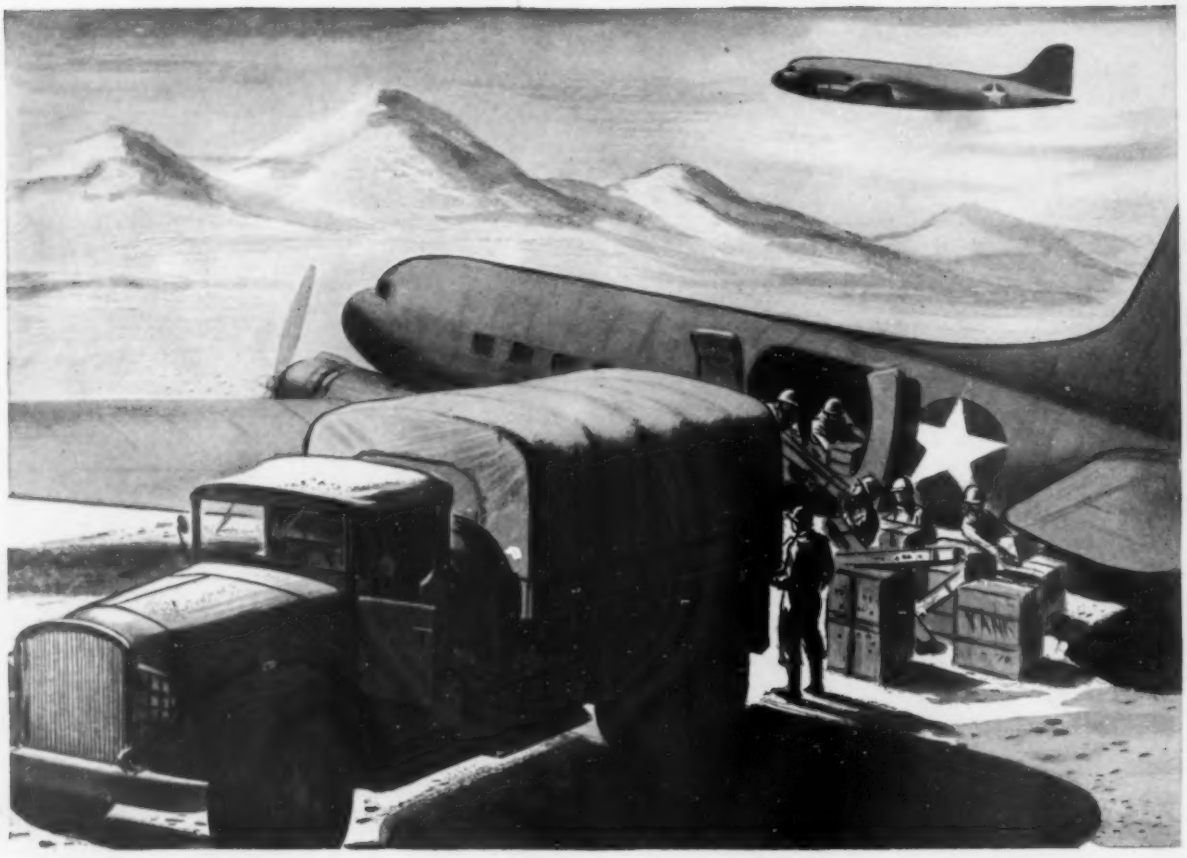
WIN THE WAR

Protect Freedom
BUY WAR BONDS

GAR WOOD INDUSTRIES, INC., Detroit



YOU SAID IT, SOLDIER

"The lumbering unprotected C-47's have become the aerial Mack trucks *of this war in North Africa"*

—from "Stars and Stripes", the soldiers' newspaper

If you've ever seen a Mack in action, you know why Stars and Stripes' soldier-reporter called those husky Douglas Skytrains "Mack trucks". For years, Americans have used the word "Mack" as an adjective to mean the best in cargo-carrying dependability.

Soldiers learned to respect Mack trucks in the last war. They watched Macks plow through Argonne mud so deep you couldn't see the wheels. In World War II, they're seeing even better Macks take even bigger loads through worse mud—and through shifting sand and freezing snow as well. They know a Mack will haul whatever you've got wherever you want it to go!

Yes, the soldiers in this war, too, will know what the phrase "Built Like a Mack" *really* means!

Mack Trucks, Inc., Empire State Building, New York, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.

Mack

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FOR EVERY PURPOSE

ONE TON TO FORTY-FIVE TONS

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IF YOU'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!

Busy as a SEABEE!

OFFICIAL U.S. NAVY PHOTOGRAPHS

● What a soft job the original "busy little bee" had. Nothing to do but "improve each shining hour." Did he ever have to land on a hostile beach . . . right on the heels of the marines . . . with a machine gun in one hand and a monkey wrench in the other? And then go right to work . . . in the tropical jungle . . . often under fire . . . building anything from an airplane landing field to a gun emplacement!

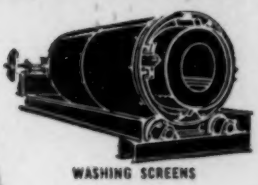
That's what the Seabees are doing. They're the Construction Battalion of the U. S. Navy —recruited from the construction and repair trades to do a big job for their Uncle Sam. And recruited to build with them is Telsmith equipment.

Crushers, vibrators, screens, elevators, gravel washers, sand tanks—all types of Telsmith aggregate-producing machinery—portable and semi-portable plants—complete stationary sand and gravel and rock crushing plants for building the Navy's large shore facilities overseas.

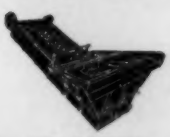
For your war work over here—Telsmith equipment is also available.

Get Bulletin E-11.

CBE-1



WASHING SCREENS



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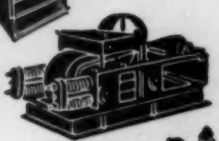
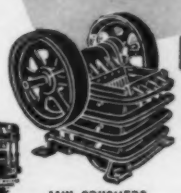
VIBRATING SCREENS

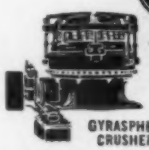
PRIMARY BREAKERS



ROLL CRUSHERS



JAW CRUSHERS



GYRASPHERE CRUSHERS

BELT AND BUCKET ELEVATORS

TELSMITH Equipment

FOR SAND, GRAVEL, ROCK CRUSHING PLANTS

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

Room 1604—50 East 42nd St. New York City
211 W. Wacker Drive Chicago, Ill.
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G. F. Seeley & Co. Toronto, Ont.
Mines Eng. & Equip. Co. San Francisco—Los Angeles
Brandeis M. & S. Co. Louisville, Ky.
Charleston Tractor & Eqpt. Corp. Charleston, W. Va.
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Wilson-Weesner-Wilkinson Co. Knoxville and Nashville, Tenn.

His book DOESN'T tell ALL

REX Mechanical Engineering—Rex M. E.—designs and manufactures more than 2000 *standard* types and sizes of chain belts.

His 768-page catalog does not include the many special chain belts and adaptations which Rex M. E. has been, and is, designing and producing for the cement industry.

Where corrosion was a problem, Rex M. E. recommended a special chain belt of Z-Metal. Standard chain belt might have been satisfactory for a time, but the special application was sure to give far longer and more efficient service.

When a chain belt with a 200-ton pull and an ultimate strength of 1,500,000 pounds was needed for producing combat material, Rex M. E. designed and produced it.

For a continuously operating drive requiring speed beyond the highest standard range, he provided "step-up" improvements in an otherwise standard chain belt.

For an exceedingly complex machine in which the space limitations were an important factor, he collaborated with the designer to work out a special chain belt installation, meeting every requirement of design and service.

For this service, Rex M. E. maintains a field organization. Many of its members served their apprenticeship in his drafting rooms and plants. For additional counsel the territorial men call on designing engineers in Milwaukee who have the advantages of national experience.

Through the work of all these men in many fields, Rex M. E. is constantly learning—and making available—much that is helpful in the great work in which all engineers are always engaged, namely, to achieve a maximal result at minimal cost and waste.

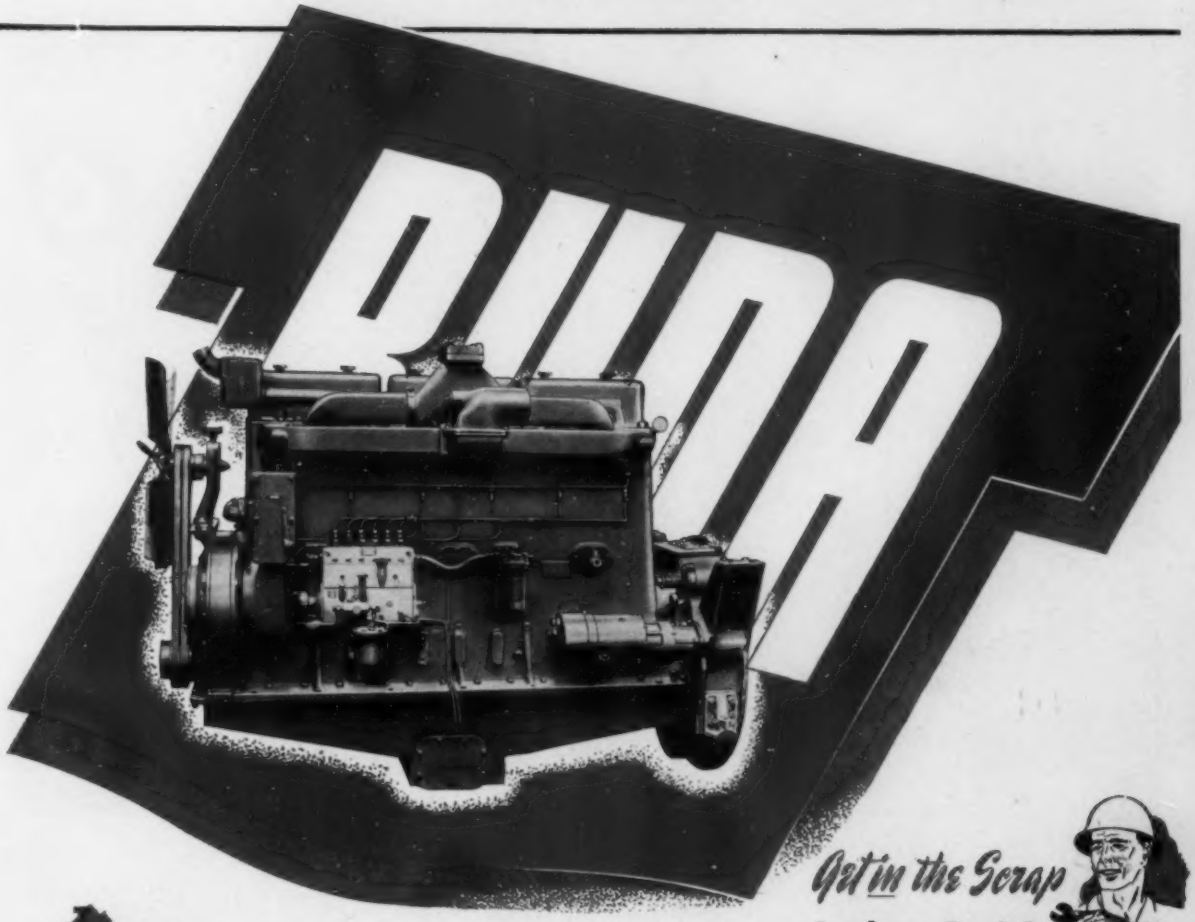
For complete information, see your Rex Man or write Chain Belt Company, 1649 West Bruce Street, Milwaukee, Wisconsin.

REX **CHAIN BELTS**

In more than 2000 sizes and types for transmitting power, timing operations, and handling materials

CHAIN BELT COMPANY OF MILWAUKEE

NOW PROPER ENGINE CARE ... pays more than ever!



In the old days, if you wanted to neglect your engine —and lose half its useful life—it was *your* tough luck. The downtime for repairs, the added costs, were out of *your* pocket.

It's different today, Mister. If the job you're doing is vital to victory, Uncle Sam can't afford downtime for repairs—and he has better places for the material, labor and tools to make repair parts for engines ruined by neglect. So check over your engine; take good care of it—*regularly!* Your nearby Buda distributor can help you—see him *now!*

Get in the Scrap

. . . don't make it!

Every engine part you save means one more for the battlefront. Take care of your engine *regularly*—check your instruction book for details on lubrication and service.

ORDINARY DIESELS

. . . High cylinder pressures produce sledge-hammer blows that punish pistons, rods and crankshaft every power stroke.

BUDA
Low-Pressure DIESELS

Prolonged "Low-pressure" combustion delivers a smooth, steady power stroke that cuts vibration, saves parts.

the **BUDA** *Co.*

HARVEY (Chicago Suburb) ILLINOIS

Any Of These Problems Bothering You?

Truck Shortage—
Gas Rationing—
Tire Rationing—
Manpower—
Limited
Production—

★ The Dempster-Dumpster system of materials handling has been a "life-saver," so to speak, for many quarry, cement, sand, gravel and other industrial plants during recent years. This is easily understood, once you realize the big job the Dempster-Dumpster is capable of.

To see it in operation, no stretch of the imagination is necessary to convince you at once that one truck, equipped with a Dempster-Dumpster Hoisting Unit, will do the same work of 3 to 5 of your present trucks. This one truck is on the go—giving maximum service—in a never ending cycle, hoisting, hauling and dumping one loaded body of material while any required number of other bodies are being loaded. A synchronized system of haulage that saves trucks, tires, gas, time, manpower and money.

The above illustrations show clearly how the Dempster-Dumpster system works at the loading point. No tracks to lay and move around. Empty bodies are placed exactly where they will be most conveniently loaded. No time is wasted by men or equipment.

Let our engineers assist you in simplifying haulage of material in your operation. Write for completely illustrated catalog NOW. Dempster-Brothers, 383 Springdale—Knoxville, Tennessee.

DEMPSTER DUMPSTER
TRADE MARK REG.

"There's a DEMPSTER-DUMPSTER Built for Every Material Handling Job."

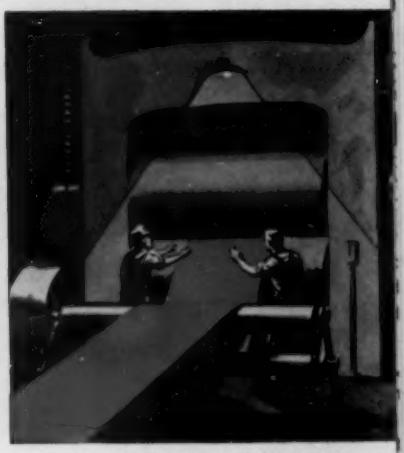
MANHATTAN FLEXLASTICS*

Bring Tomorrow One Day Nearer

for users of Industrial Rubber

*Rubber manufacture is a blending of art and science. At MANHATTAN, it begins with a giant automatic mixer blending the right ingredients in correct proportions to assure ultimate FLEXLASTICS.**

*Great rolls "plasticize" the mixture to give it uniformity and homogeneity. Skill and experience must join hands with formulas, equipment and engineering to deliver the lasting service of FLEXLASTICS.**



Great calenders bond FLEXLASTICS intimately to the built-in strength members at MANHATTAN. These may be of fabric or specially twisted cord or metal, or combinations of these.*

Vulcanizing FLEXLASTICS to give lasting service calls for close controls, skill and a long background of experience. Different techniques are required for different FLEXLASTICS.*

THE use of "manufactured" rubbers—commonly termed as synthetic rubber—is by no means a temporary expedient.

The special-purpose synthetic rubbers—as used in MANHATTAN Paranite-G.O.P. products—have become well established in many applications where they render superior service to natural rubber.

They are the fruit of long experience and of the same pioneering policy which made MANHATTAN the first American rubber manufacturer to initiate a continuous program of research in the industrial applications for the special-purpose synthetic rubbers then available.

To this long experience in the art of compounding and processing all available types of rubber was added the knowledge of how to make and where to place *built-in strength members*—acquired by engineering research and protracted service tests. . . . This was an additional ingredient to the 250-odd from which more than 1,000 different MANHATTAN compoundings derived increased strength, greater flexibility, cohesion and elasticity—to such a degree that it justified the coinage of a new term—FLEXLASTICS.*

The word "engineered"—long used by MANHATTAN—is well supplemented by this term "FLEXLASTICS*" so descriptive of the qualities essential in rubber products that have to deliver service under war strain.

FLEXLASTICS* is the assurance that the "engineered" characteristics are in every MANHATTAN flat or V-belt; conveyor or elevator belt; air, steam, water or other type hose; or other item regardless of the kind of rubber from which it is now made.

Condor

Conveyor and Elevator Belt
Compensated Belt
Transmission Belt
V-Belt
Air Hose
Contractors Hose
Fire Hose
Hydraulic Hose
Oil and Gasoline Hose
Sand Blast Hose
Steam Hose
Suction Hose
Water Hose

Chute Lining
Launder Lining
Industrial Brake Blocks and Lining
Molded Rubber Goods

Rubber Lined Tanks
Rubber Covered Rolls

Abrasive Wheels
Bowling Balls

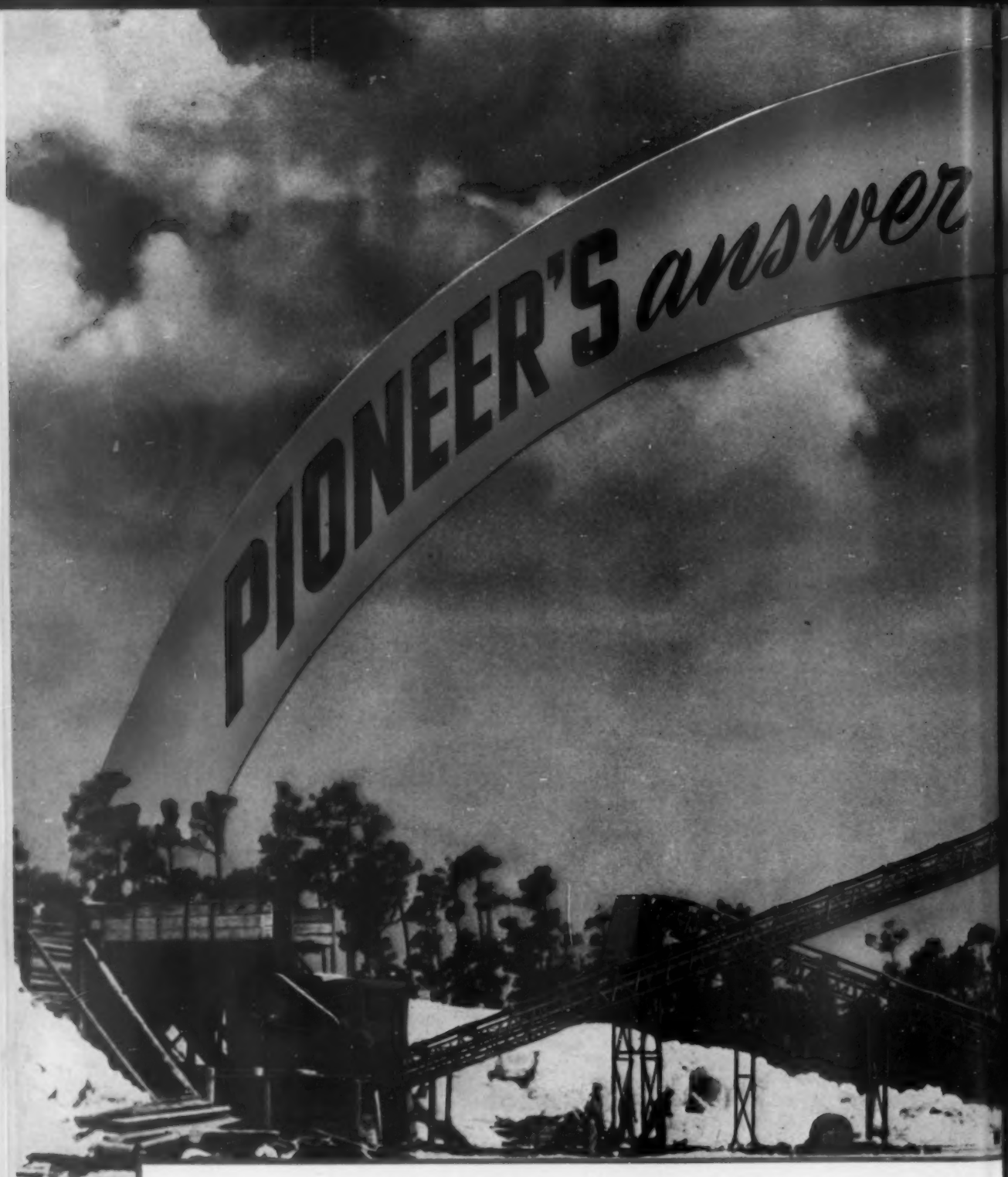
THROW YOUR SCRAP INTO THE SCRAP!

50 YEARS OF RESEARCH *For a business to have lived 50 years and grown continuously, is evidence of vitality and vision. The zealous preservation of that vitality and vision to be applied to production, service and research, is the obligation which management at MANHATTAN has inherited from its founders. FLEXLASTICS* are another stage in the discharge of that obligation.*

*The term FLEXLASTICS is a MANHATTAN trade mark. Only MANHATTAN can make FLEXLASTICS.

KEEP AHEAD WITH MANHATTAN

THE MANHATTAN RUBBER MANUFACTURING DIVISION
of RAYBESTOS-MANHATTAN, INC.
EXECUTIVE OFFICES PASSAIC, NEW JERSEY



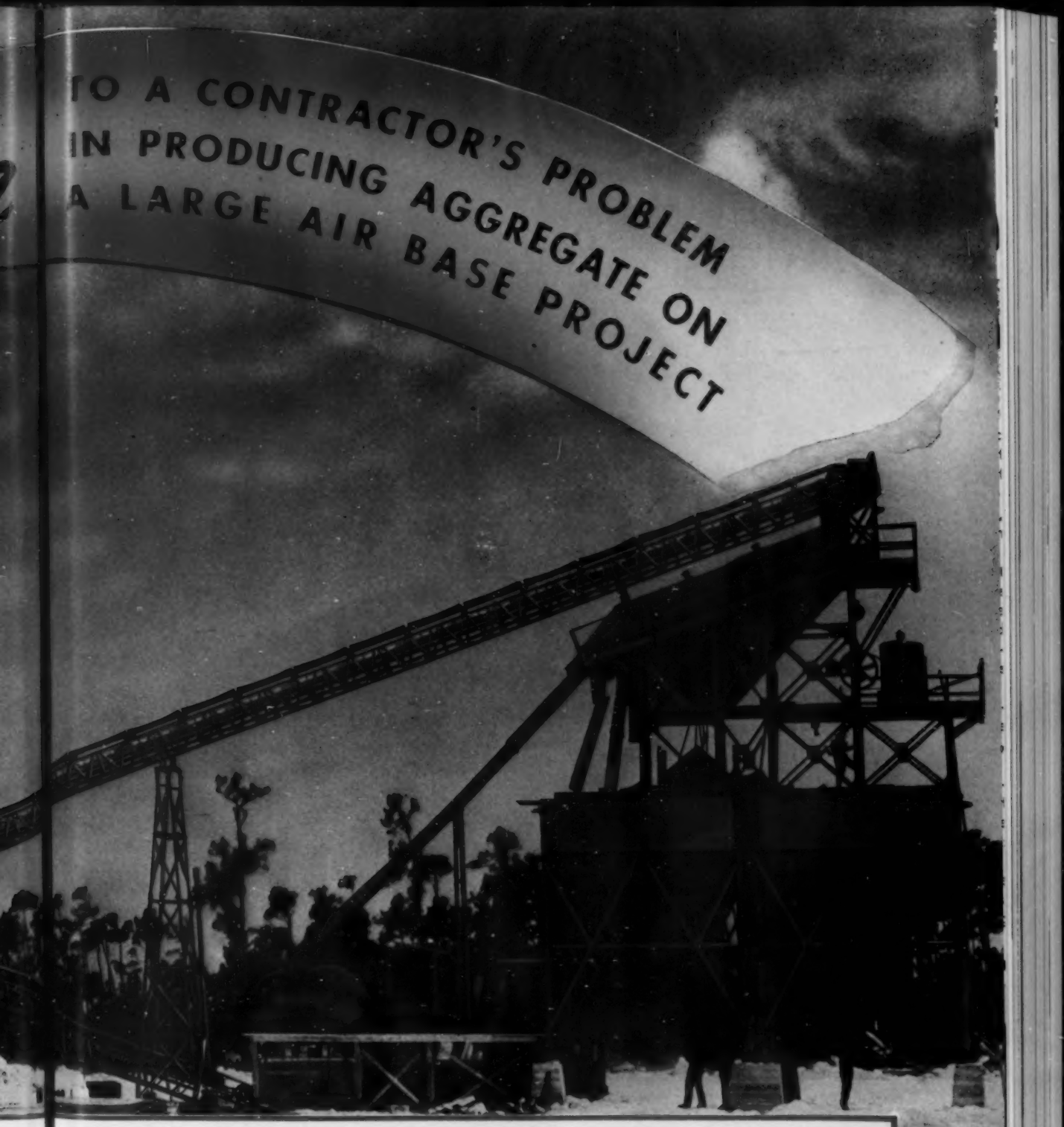
One of the big problems on the big airbase jobs these days is to produce sufficient quantities of suitable aggregates. Concrete construction requires sized, crushed, and washed aggregate. Bituminous surfacing materials should be crushed and sized.

In most cases, there is little choice of materials. It is necessary that the aggregate plant be capable of processing any available materials so they are suitable for the job.

Here is Pioneer's answer. A semi-portable plant that is complete with steel bins and conveyors, both designed to be knocked down for moving.

The plant consists of a traveling grizzly feeder—a 30"x 42" primary jaw crusher—a 54"x24" secondary roll crusher—a 40"x22" final roll crusher—a 4'x16' vibrating screen—four steel storage bins—washing equipment—lattice frame belt conveyors and Diesel power.

The complete plant was designed by Pioneer Engineers—factory built and shipped complete with all necessary



drives, spouting, and everything except the foundation

One manufacturer is responsible for all the equipment. It is a balanced plant, without a bottleneck. It is easy and quick to set up as soon as it arrives on the job.

This plant will operate in quarry rock or gravel and it will produce clean, graded, crushed aggregate. If necessary, it will produce sand from quarry rock.

Maybe Pioneer can answer your problem too.

Pioneer
ENGINEERING WORKS
Minneapolis, Minnesota, U. S. A.

Which TYPE *of* V-Belt
Best Fits *YOUR* Need?

– Special **Synthetic** Belts?
– **Steel Cable** Belts?
– **Rayon-Cord** Belts?
– **Standard** Vulco Ropes?

Phone Your Gates Field Engineer–
He Will Tell You!

If you have a drive on which a V-belt of special type may be required for greatest service efficiency, you will almost certainly find that Gates has long been building a V-belt precisely engineered to fit your needs.

In some installations, a V-belt whose tension member is composed of rayon cords will have advantages over the standard cotton cord construction. Gates has been building rayon-cord belts since 1939.

Again, Gates engineers have found that a belt built with flexible steel cables as the tension member is sometimes most economical despite its higher initial cost—and Gates has been building flexible steel cable V-belts since 1935.

For five years, the Gates synthetic rubber belt has been piling up amazing service records in large industrial plants all over the United States. Under severe conditions of heat and oil, the Gates special synthetic belt actually outwears any natural rubber belt by as much as 230%.

It might seem that it would be some trouble to determine whether a synthetic-rayon, a synthetic-steel-cable, or a standard Gates Vulco Rope would be most efficient and economical for your particular application. Actually, this involves no more than picking up your phone.

There is a Gates engineering office in every large industrial center. The Gates field engineer who consults you in answer to your phone call is thoroughly competent to analyze any drive problem you may have. He is completely informed on the nature and advantages of every type of belt. He will always recommend the practice that will be most efficient and economical for you.

438

THE GATES RUBBER COMPANY
Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO, ILL. 549 West Washington
NEW YORK CITY 215-219 Fourth Avenue
ATLANTA, GA. 738 C. & S. National Bank Building
LOS ANGELES, CAL. 2240 East Washington Boulevard
DENVER, COLO. 999 South Broadway
DALLAS, TEXAS 2213 Griffin Street
PORTLAND, ORE. 333 N. W. 5th Avenue
SAN FRANCISCO, CAL. 1090 Bryant Street

The PYRAMID BUILDERS were PIKERS!

Cedarapids

Built by IOWA

OVER ½ a Million tons in less than nine months from one CEDARAPIDS Crushing Plant for HENRY STAFFORD

Lamesa, Texas

IT took them 20 years and a hundred thousand men to toss the equivalent of a million and a half cu. yds. of aggregate into the great pyramid of Cheops — and that is still considered a big job.

If the country had to wait that long for material for airports, fortifications, strategic roads and other jobs equally as Herculean as the pyramids, the war never would be won.

The Pyramid builders were pikers! The Cedarapids plant of Henry Stafford alone with its small crew is equalling this yardage in less than 2½ years. In 288 days, less than nine months and in spite of several moves this plant alone turned out over half a million cu. yds. of minus 2 in. material on airport work and reached an output of 4688 cu. yds. of minus 2 in. material in one day.

This plant is an outstanding example of Cedarapids portability. All units are on rubber, including conveyors and the receiving hopper is only 9 ft. above the ground — materially facilitating feeding.

Whether it's winning a war or a peace time job, construction begins with aggregate, and when *time* and thousands of dollars worth of labor and other equipment depend on the aggregate plant you have to have dependability and *output* fast and at low cost.

Iowa Cedarapids plants — both large and small have been proved under both peace time and war time conditions. Come to Headquarters for aggregate producing and handling equipment.

IOWA MANUFACTURING COMPANY
Cedar Rapids Iowa

IN
CEMENT
AGGREGATES
LIME
GYPSUM
READY-MIX
CONCRETE
PRODUCTS
INDUSTRIAL
MINERALS

IT'S

ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY

FOR

* Buying Power Coverage
* Editorial Progressiveness

*** A Few of Many of ROCK PRODUCTS Current Achievements That Show It Can Do the Best Job with Your Advertising Dollar**

1. EDITORIALLY STAFFED by outstanding authoritative writers.
2. FIRST in cement circulation.
3. FIRST in reader preference among volume aggregate producers.
4. FIRST in concrete products circulation among ROCK PRODUCTS industry papers.
5. FIRST in 1943 shovel advertising.
6. FIRST in 1943 wire rope advertising.
7. ONLY ABP paper in its field.
8. OLDEST ABC member paper in its field.
9. ONLY paper in its field to progress to departmentalized, processing stage articles.
10. NEWS COVERAGE obtained by four, full-time, experienced editors who really travel . . . plus highly recognized contributors.

ROCK PRODUCTS

TRADEPRESS PUBLISHING CORPORATION

CHICAGO—309 W. Jackson Blvd.
NEW YORK—522 Fifth Avenue
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Clipper pilots have extra eyes

To assist in making night-time landings at the far-flung marine and land bases of Pan American World Airways, every Clipper captain has several "extra eyes"... radio, navigation, wing lights — and a piercing, dependable beacon light.

The big Diesel generators that pump power to these street lamps of the sky are the Clipper stations' nerve centers. They supply electricity for work shops, kitchens and living quarters — as well as illumination. They must be kept going at top efficiency night and day. To make sure they do, Pan American lubricates its Diesels with RPM DELO.

RPM DELO frequently doubles the time between Diesel overhauls. It ends ring-sticking, protects bearings against corrosion, cuts ring and liner wear to the thinnest minimum. No other lubricating oil gives your Diesels the protection they get from RPM DELO— because no other compounded oil combines its ring-cleaning, non-corrosive and anti-oxidant properties.

ORDER RPM DELO FOR YOUR DIESELS

RPM DELO is marketed under these names:

RPM DELO
Caltex RPM DELO
Kyso RPM DELO
Signal RPM DELO
Sohio RPM DELO
Imperial-RPM DELO
CONCENTRATE

Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your vicinity

STANDARD OIL COMPANY OF CALIFORNIA

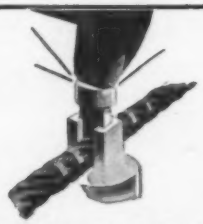
"Old friend . . . fine wire rope"

Several thousand miles to the west of where you're reading this, an American face lights up as a welcome friend from home arrives.

Back here in the States, like thousands of others now in uniform, he learned the friendliness of dependable Wickwire Rope.

He knows *you* need Wickwire Rope, too, to keep things running on the home front. So he appreciates *your* contribution in making the rope you already have last longer, so more can be spared for the important work over *there*. But when you *do* order, won't you take it in coils when the lengths permit—so the handier reels can go to the front? Wickwire Spencer Steel Company, 500 Fifth Ave., New York.

For outstanding production accomplishments, Wickwire Rope was the first in all New England to win the coveted Maritime M and Victory Fleet Flag.



WHEN CUTTING WIRE ROPE, seizing is important, whether it is preformed or standard lay. The free book "Know Your Ropes" will help your new men (old, too!) learn the right and wrong ways to care for and handle wire rope to make it last longer. Send for your free copy.

SEND YOUR WIRE ROPE QUESTIONS TO WICKWIRE SPENCER

WICKWIRE — WICKWIRE SPENCER STEEL COMPANY

WICKWIRE ROPE

Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City

WISSCO PRODUCTS

SAFER TO HANDLE . . . SAFER TO USE

NITRAMON

Helps meet TODAY'S production schedules

IN EVERY INDUSTRY today's production demands put a heavy strain on safety. Quarry operations are no exception. War needs must be met. Schedules must be maintained—yet there must be no compromise with safety.

Du Pont **NITRAMON**—the safest blasting agent—helps quarrymen meet these exacting conditions. It's safer to handle—safer to use.

NITRAMON is not an explosive in the accepted sense of the word. The strongest commercial blasting caps won't detonate it. Nor will "Primacord," open flame, falling objects, drill bits, or even the impact of a rifle bullet! And yet, **NITRAMON** is readily detonated by a **NITRAMON PRIMER.**

In addition to its safety, **NITRAMON** offers distinct economies in many operations. Ask your Du Pont Explosives Representative about this safer, more economical blasting agent. Or, write E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

DU PONT

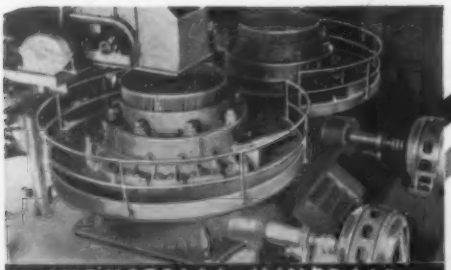
REG. U.S. PAT. OFF.

NITRAMON

TRADE MARK

the safest blasting agent

FATS MAKE GAS MASKS . . . one pound of waste cooking fat makes enough glycerin to produce three Cellophane gas mask bags. Urge housewives to save and sell waste fats to their butchers.

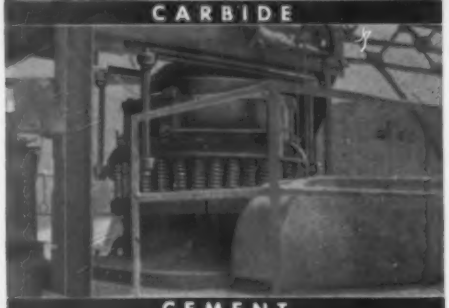


INDUSTRIAL MINERALS

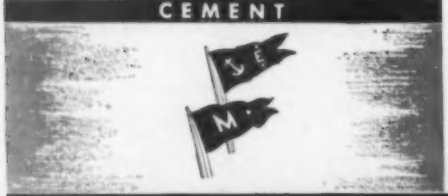
METALS

NITRATE

CARBIDE



CEMENT



Finer Crushed Materials For Wartime Needs . . .

Increased production of many of our vital wartime materials is dependent on the performance of the Symons Cone Crusher. The ability of the Cone to deliver a finer crushed product in greater quantity is being demonstrated in the production of many metals and industrial minerals so essential to the prosecution of the war. If your operations involve fine crushing, investigate the merits of this unusual crusher.

NORDBERG MFG. CO.
MILWAUKEE WISCONSIN
NEW YORK · LOS ANGELES · LONDON · TORONTO

NORDBERG MACHINERY

SYMONS CONE CRUSHERS

Save Seconds Every Trip

DUMPTORS PROVIDE SPEED VITAL TO WAR CONSTRUCTION

The operator merely trips the lever, and he's ready for another trip . . . that's how seconds are saved on every load. The Koehring Dumptor has no complicated mechanical body hoist arrangement . . . no delays . . . no hoist repair worries. The load is dumped exactly where you want it . . . when you want it . . . because it's simple and instantaneous. Traveling forward or reverse with three speeds either way helps keep lost time at a minimum.

KOEHRING COMPANY
Milwaukee, Wis.

Depend on your Koehring distributor to help you keep your equipment operating. Care for your Koehring equipment NOW, so it will serve you tomorrow. Koehring distributors have genuine Koehring parts. Koehring parts warehouses are at your service.

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

There's room for only

One Sun

THE barbaric Jap who rules by the bayonet is having his brief day of power over your Philippine land. This power, which reached its peak through shameful treachery, is on its way down. It will fail as surely as the bloody, dishonored sun-flag and the 30,000 Japs who sank beneath the Bismarck Sea!

We are one with you, Philippine brother, in the resolve that only one kindly sun shall remain above the Pacific. We are working and fighting toward that certain day.

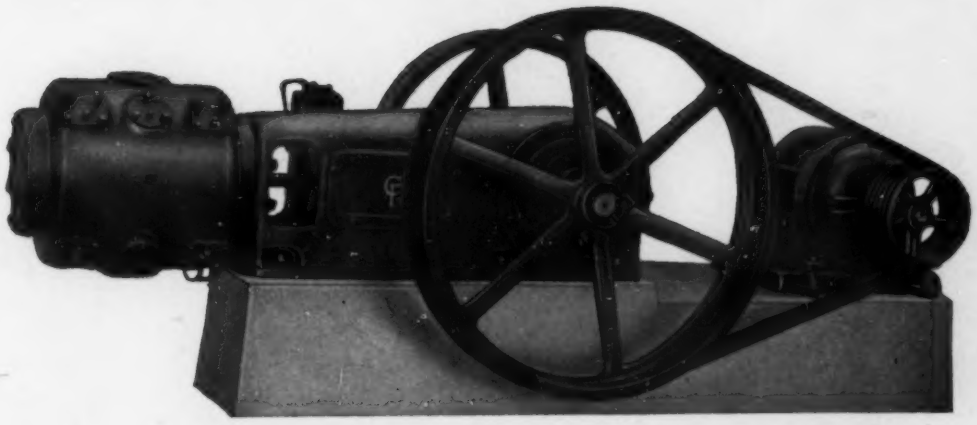
As our forces fight, we work to give them weapons — tanks, planes, guns, ships. The materials to make these, every ton, must be won from the earth by determined men in mine and quarry. Their greatest weapon, in turn, is explosive force safely set free by Ensign-Bickford Safety Fuse and Primacord-Bickford Detonating Fuse. We manufacture this fuse with skill and care and pride—mindful of our responsibility to mining men, for *Victory Begins Underground!*

H-P

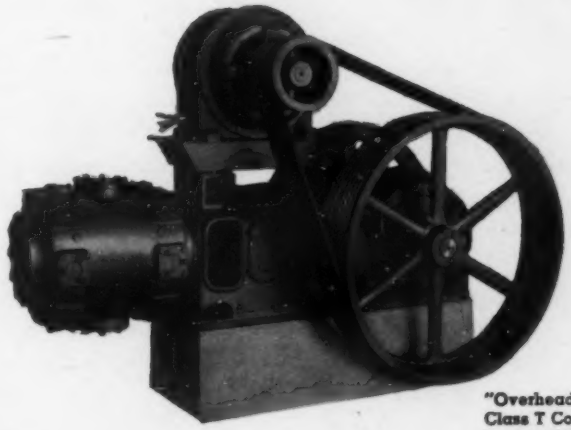
THE ENSIGN-BICKFORD CO.
SIMSBURY, CONNECTICUT

Primacord-Bickford
Detonating Fuse

A Heavy Duty COMPRESSOR
FOR TWENTY-FOUR HOUR SERVICE



Available For Quick Deliveries



"Overhead "V" belt drive ideally adapts Class T Compressor for use where space is limited."

Chicago Pneumatic Class T Compressors are built in a wide range of sizes . . . 15 to 125 h.p. . . . in single or multi-stage designs . . . for pressures up to 5,000 pounds . . . "V" belt, synchronous motor or steam drive. Also available with "Oilless" cylinder for use where compressed air must be free of oil. Send for Bulletin 728.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
(Hicycle...Universal)
ROCK DRILLS

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

A taut steel rope angles down into the boiling wake, so small in proportion to the vessel that it seems like a fishing line over the stern of a rowboat.

Far off over the rim of the horizon, there's a flicker of light followed by a sound like distant thunder. The steel rope jerks as if some huge sea monster were nibbling at it.

The steel line is not for fishing. It's a target-towing hawser. The distant thunder comes from the big guns of a battleship. The "nibbling" is the impact of heavy shells upon the target.

Naval target-towing hawser is one of the many special war ropes now being produced by Bethlehem Steel Company. Because of its great length, this rope must be light yet incredibly strong. It must also resist corrosion by sea water. To solve this particular problem, Bethlehem developed steel rope wire with very high strength and shock resistance. This wire is coated by the exclusive bethanizing process. Bethanizing is an electrolytic coating process which produces the purest, tightest, most uniform zinc armor ever applied to rope wire, and yet does not reduce the toughness or fatigue-resistance of the wire.

Every foot of wire rope made by Bethlehem is helping in some way to win the war. We're working 168 hours a week to supply the battlefronts and yet not neglect the mines, quarries, mills, factories and dozens of other "musts" at home.

BETHLEHEM STEEL

MOVING A MOUNTAIN TO *FEED* A WAR

RIGHT NOW—*today*—American men and equipment are performing miracles. Even the task of moving mountains has become more fact than fancy.

In the huge open pits which hold the critical minerals we need for Victory, you'll hear the incessant hum of motors as big P&H Electric Shovels keep up their steady digging rhythm — wresting raw materials from the earth to feed war's enormous appetite.

Dreams which began almost 60 years ago are today realities that are serving America in her time of need—in mining, in industry, in construction work of many kinds. They are the dreams that made P&H a leader in applying electrical power to the movement of heavy loads — to save human labor and help create a better world.

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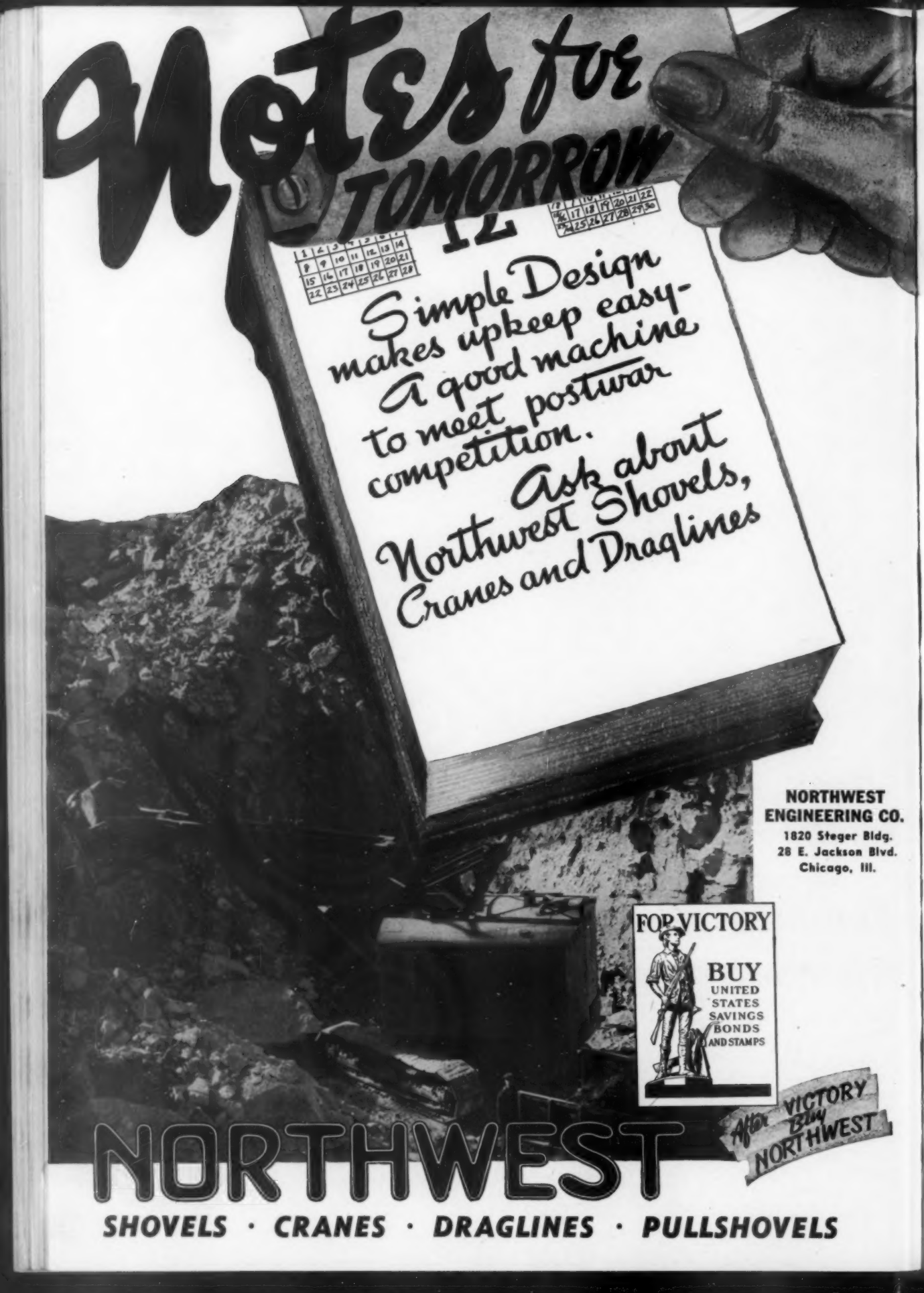
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The Care and Feeding of Rock Crushers

No. 4 of a series of advertisements published in the interests of national economy and to aid those users of crushing equipment unable to secure new units during the emergency.

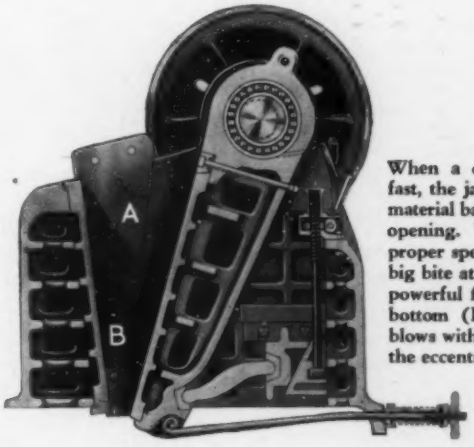
What Operating Speed for Maximum Output?

As with a gasoline or diesel engine, there is an ideal speed at which crushers will provide maximum efficiency. Operating below that range may provide increased crushing efficiency at the expense of volume; and operating above that range may provide decreased crushing efficiency and decreased volume, because of choking and premature wear of the jaws and other parts.

Crushers should be operated within the range of speeds indicated on the name plate. Universal engineers are familiar with all sorts of rock, ores and slags and are glad to be consulted where special cases indicate higher or lower than standard operating speeds.

When a crusher is run too fast it will not grip the rock. This results in slippage and causes rapid wear of the jaws. Do not operate on the theory that every revolution of the eccentric shaft gives a crushing blow and, therefore, increased capacity.

There is a peak speed which, when exceeded, causes decreased production. Therefore, the increased speed over the peak is wasteful and wears out equipment much faster. *At high speeds, rock floats in the crusher and jaws cannot grip it readily.*



When a crusher is run too fast, the jaws tend to squeeze material back up into the feed opening. When run at the proper speed, the jaws take a big bite at the top (A) and a powerful finishing bite at the bottom (B) — two crushing blows with each revolution of the eccentric shaft.

The "Overhead Eccentric" crushing principle, pioneered by Universal, gives maximum production.

We've earned this WAR BOND buyer's flag to help keep "Old Glory" flying!

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Formerly Universal Crusher Co.
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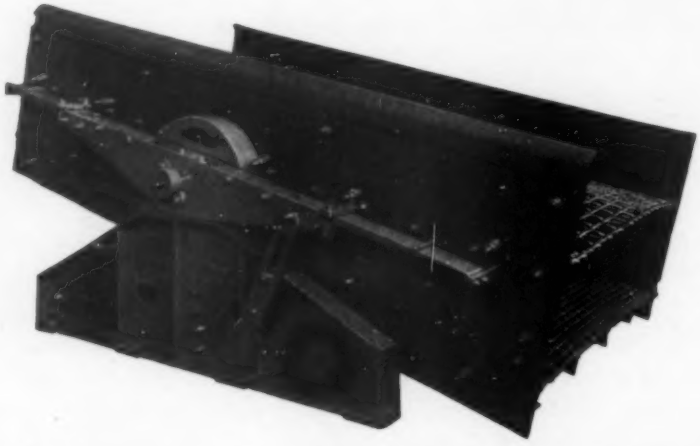
UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS



ROBINS VIBRATING SCREENS ARE ENGINEERED

. . . for the specific job they are to perform

The efficiency, the economy, the durability you get from your vibrating screens depend to a great extent upon their ability to perform the precise functions and to handle the specific materials encountered in your plant.

Robins Vibrating Screens are engineered individually for each job . . . given the correct speed, stroke, pitch and number of decks required for the kind, weight, mass, flow and quantity of bulk material to be sized and handled.

The screens, themselves, represent outstanding examples of engineered designing. Take the Robins *Gyrex*, for example. It employs the single-shaft, circle-throw, positive stroke principle . . . a principle which, by the way, was originated by Robins, and on which we still hold basic patents. Added to the benefits and advantages of this principle are features which further promote efficiency, further increase productivity, further reduce maintenance expense . . . features found in no other makes or kinds of vibrating screens. Among them are:

1. Ability to adjust the angle of the live frame without requiring any change of the supports.
2. A stabilizing arrangement of the springs which relieves the eccentric bearings from the impact of thrust loads.
3. A heavy, anvil-type floor-mounted cast base which absorbs impact forces eliminating the need for costly foundations or supports.
4. Triply-protected cloth arrangement. The cloth is supported over rubber-cushioned members; it is maintained under spring tension; it has a slight transverse arch. Whipping and crystalization are eliminated; failure from these causes is prevented. The arch further tends to distribute material across the full width of the screening surface—all of which is serviceable since there are no clamps, no straps, no bars to blank-off this screening area.

Robins *Gyrex* Vibrating Screens are intended for heavy duty sizing and scalping. For fine sizing, the Robins *Vibrex* has a high-speed, unbalanced vibrator. For horizontal installations and dewatering, the Robins *Eliptex* has an elliptical throw—to convey oversize material. Fully illustrated and descriptive bulletins sent on request. Kindly address your request to Dept. RP-8.

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How Permanent Can Concrete Be?

IF OUR MEMORY serves us correctly, a few years ago the Federal Trade Commission issued an order to the Barre (Vt.) granite gravestone quarry men to cease and desist advertising their product as "everlasting" and "eternal," on the ground that absolutely nothing on God's green earth is everlasting and eternal. On the same ground the Commission may some day get around to the portland cement industry's slogan "concrete for permanence." Any geologist can tell you that granite is one of the most durable of nature's rocks; but, that *all* rocks weather, dissolve and disintegrate, else there would be no form of life on this green earth.

There is no reason to expect that the man-made rock we call concrete should be any exception to the laws of nature; incidentally, this is one law of nature that even the experts in Washington today have not been able to repeal or circumvent. However, some rocks weather and disintegrate more rapidly, or less slowly, than others, and the same kind of rock disintegrates more rapidly in some kinds of environment than in other kinds (wet and dry climates, for example). The concrete construction industry would do better to call on the geochemist and the soil chemist for the answers than to look to materials testing engineers and professors of engineering (and we certainly mean no slight to engineers). The solution to the problem of concrete disintegration obviously lies in a better understanding of the colloid chemistry of rocks and soils. Probably, it is closely related to the base exchange phenomena of soil chemistry; or even perhaps is the same thing.

This problem of the relatively rapid disintegration of some particular concretes, at present assumed to be caused by use of high alkali portland cements with certain kinds of aggregates, was very much in the foreground at the recent annual meeting of the American Society for Testing Materials, although it has been agitated by several engineers for the past two or three years. Now, however, the agitation has reached a point where no one interested in promoting the use of concrete in exposed structures can afford to try to laugh it off.

There is very good reason to doubt if it makes any difference whether the "alkali"—soda, potash, etc.—is in the cement or in the aggregate. In the presence of water or moisture, conditions are set up within the concrete mass for activity in colloid chemistry. One very active alkali is *always* present and that is calcium hydroxide [$Ca(OH)_2$], or hydrated lime (some 17 percent of this material is set free in the hydration of cement). Soil chemists know that calcium hydroxide in the pores of the soil will make things happen. The pH value of the soil changes, which is another way of saying that chemical changes are taking place; and in these changes calcium, sodium, potassium, silicon and aluminum are playing important parts; they are in fact changing places in the soil minerals.

We have heard it said that it is an anomaly to find that coarse aggregates which cause disintegration of concrete, when pulverized and used as an admixture (a puzzuolana), are helpful in overcoming disintegration. Instead of being anomalous, it seems to us very natural that this should be so. When finely pulverized and distributed through the concrete, the puzzuolanic materials, being now more reactive because of their greater surface area, react to form only minute, widely distributed particles of gels or tiny crystals. These help fill the pores in the concrete, aid as binding agents and decrease the permeability of the concrete. If the concrete were really impermeable, and no water came in contact with the lime, soda, potash, silica, etc., we probably would not be troubled with this kind of disintegrating concrete.

Any disruptive effect from the formation of gels or crystals from the puzzuolanic aggregate in pulverized condition would obviously be in proportion to the size of the deposits, which would be very small, and very well distributed. On the other hand, the same material used as large aggregate would tend to the formation of large accretions of gels or crystals, very localized, which certainly could cause disruptive expansions, although the time required for the reaction would be much longer.

Now, if these reactions between cement and aggregates are in the realm of colloid chemistry, as we firmly believe they are, there are ways and means of inhibiting such reactions, or at least of slowing them down, so that properly made concrete can be "permanent" to all practical purposes, even if not altruistically so. Don't ask us what to use or where to find it. Our knowledge of colloid chemistry is much too limited. But in that field lies the answer, because colloidal solutions, through which these bad actors must have to pass, can be flocculated (or agglomerated), or the colloids can be dispersed or they can be jelled. Presumably then either flocculation or jelling in the interior of the concrete can be prevented by using the proper "dope."

Nathan C. Rockwood

Testing Auger

A SOUTHERN GRAVEL PRODUCER wanted to test the thickness of the overburden that rested on top of his gravel, so he rigged up a simple drilling rig as shown in the illustration.

Determine overburden with testing auger

A 5-in. auger was suspended from a tripod, and the supports so designed that the auger could be manipulated with hand wrenches or even a bar. When a cut of sufficient depth has been made, the rope hand line can be wrapped about the jack shaft, using the stub of the shaft as a gypsy-head. This lifts out the auger and its load of cuttings.

Safety Signs

IN CALIFORNIA safety pays dividends, for usually the amount of insurance paid into the fund is based on a relatively high accident rate. Then if during the current year accidents are at a lower rate, a part of this excess charge is refunded. One company employing about 125 men had a refund for one year of almost $10,000. So when this amount of money is returned to any company it does not take the management long to realize that safety pays in dollars and cents as well as in the humanitarian aspect.

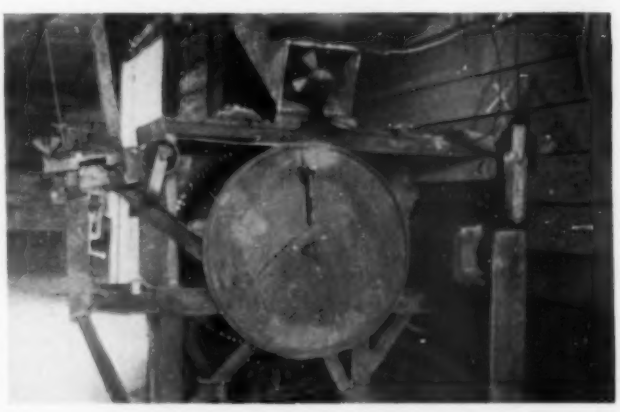
This type of safety sign attracts attention

One good way to help keep these refunds coming back is by the simple means of attractive signs—signs that will attract attention. The one shown in the illustration would remind anyone that "This ain't no Bull—Safety Pays."

Welding Bell-End Pipe Reinforcing Hoops

CONCRETE PIPE manufacturers have been extremely busy during the past two years, and have had to resort to many short-cuts in speeding up operation. Ed Warner, manager of Harrison Concrete Pipe Co., Tacoma, Wash., developed a very ingenious device used by his welder in making the wire reinforcement for the bell end of concrete pipe.

As shown in the illustration, the wire is fed from a reel above through a spring tension arrangement to a metal cylindrical disc to which the wire is attached. This disc is revolved by a small electric motor through a large gear, for a suitable speed reduction, and is controlled by foot-operated clutch. It is a simple matter for the welder to use this jig in welding a large number of circular wire hoops in a comparatively short time while sitting comfortably on a chair. Directly above the point of welding on the horizontal frame member of the jig is a fan to draw the fumes from welding into a duct.

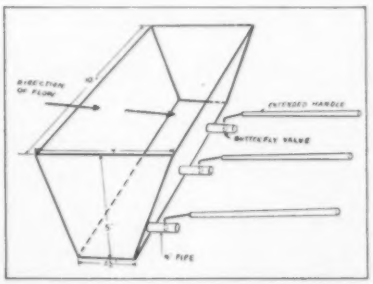


Handy jig set up to weld reinforcing wire hoops for the bell ends of concrete pipe

Southern Sand Practice

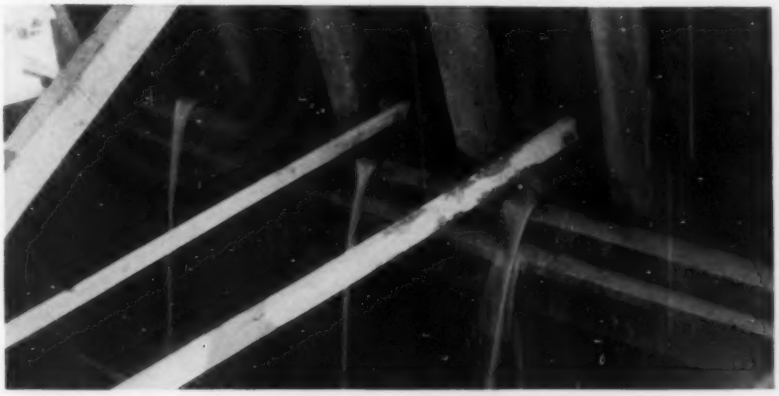
PRODUCTION of sand in many of the Southern plants is very simple. Usually there are not more than two sizes of sand made at a plant. The settling cones or boxes are usually of wood and built on the job.

A typical example of such an installation is at the new plant of the Yazoo-Tennessee Gravel Co., Memphis, Tenn. After removal of the plus ¼-in. material on stationary screens, the sand is sluiced to two settling boxes. Each box is about 10 ft. wide and 5 ft. deep. It is hopper shaped and is 5 ft. wide at the top and about 2 ft. wide at the bottom. The longest dimension is at right angles to the flow of material.



Construction details of sand settling box

The sand is removed through three simple butterfly valves inserted in 4-in. tubing. For the convenience of the operator, the handles of each of the three valves are extended across



Outlets for sand from the sand settling hoppers

the top of the sand bin.

A screen can be placed over the top of the sand settling device should it be desirable to make a finer sized material.

The two sand boxes usually operate in series, the first one removing the coarser sizes.

New Type Wheelbarrows

AT LAST SOME INVENTOR has developed a wheelbarrow that most any novice can handle—a two-wheeler and with rubber tires. Several of

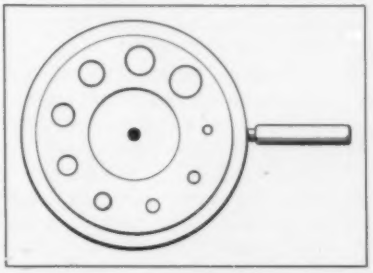
Rubber-tired "two-wheeler" which is easier to handle than the single wheel type

them are operated at the Jordan Concrete Pipe Co. plant at Fresno, Calif. It is said that they work fine, load and unload without so much lost time and have all the advantages of the old one wheel type.

Slurry Feeder

IN A CALIFORNIA cement plant slurry is fed to the secondary pebble mills by means of a special valve or gate that was developed by one of the company's engineers.

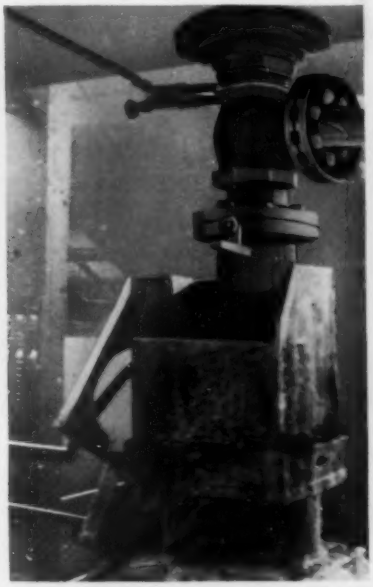
The feeder consists of a circular plate through which a series of round openings have been drilled, each of different size. The plate is of special wear-resisting steel. This plate as-



Plan view of plate attached to gate valve which regulates flow through holes graduated as to size

sembly is mounted under a conventional gate valve.

The device is so designed that by means of a handle extending outward horizontally, the plate can be moved to permit slurry to pass through any of the holes. The hole used will depend upon the amount of



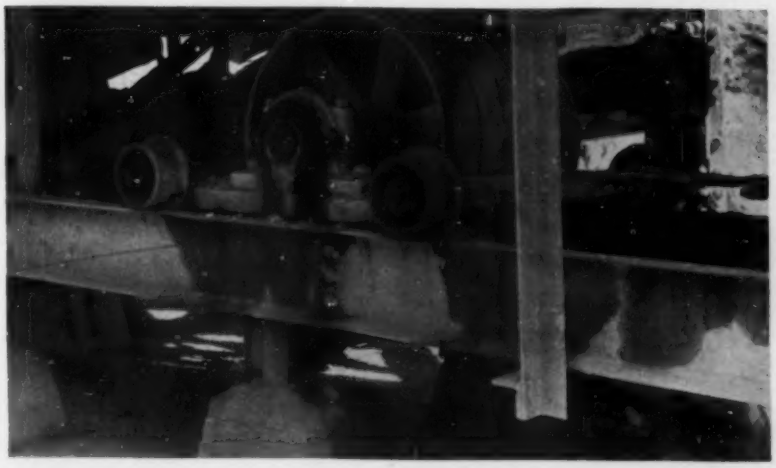
Slurry gate valve equipped with a perforated plate to regulate flow

slurry desired to be fed. This is a small, simple and inexpensive device for feeding pulps and requires no moving parts. The device has been patented.

Floating Tail Pulley

AT A SOUTHERN CEMENT PLANT where the limestone and clay are delivered to the plant by a series of belt conveyors there are several interesting features, one of which is the use of a floating type tail pulley. The pulley, bearings and assembly are mounted on four small diameter flanged wheels that ride heavy channel irons.

The belt is kept tight by means of a counter-weight.



Pulley mounted on wheels with counterweight to keep it tight

Left: Tunnel conveyor operator receives instructions from office by intercommunication system. Right: Loud speaker in tunnel

Communication System to Tunnel Conveyor Operator

AT THE DISTRIBUTING YARD of Parker Bros. & Co., Houston, Texas, large tonnages of sand, gravel, and oyster shells are reclaimed from tunnels under the stock piles. One of these tunnels is about 500 ft. long and an operator is stationed in it. To speed up communications between the departmental heads and the operator, an annunciator system has been installed so that instructions can be quickly given the operator as to what materials to send onto the belt. At several places in the tunnel loud speakers are located. There are also many other loud speakers about the plant. In this manner production is maintained without confusion and orders carried out with dispatch.

Simple Flat-End Horizontal Tank Calculator

By C. E. HEINZ

CALCULATION of the areas of circular segments of each new tank problem is slow work, but must be done to prepare charts or depth-sticks for workmen. To speed up this work in plant and office, I have used this simple master work sheet for many years.

The chart is easy to construct on 2- x 2-cycle log paper, a straight line through points 1.348, 1.866, 2.450 and 50, or percent of volume is 4.0, 5.0, 6.0 and 50 percent of the end diameter.

How to Use the Chart

1. Procure inside diameter and length of flat-end horizontal tank to be studied.
2. Calculate the capacity in terms of gallons, cu. ft., etc.
3. Measure unfilled space if more than half full or depth of liquid if less than half full.
4. Convert the part of the diameter in No. 3 above, to percentage of the diameter.
5. Locate the percent *diameter* on the chart left side, read through to the diagonal line, and then down to read percentage of *volume*.
6. Data found so rapidly by this simple chart can be converted into simple tables or a depth-stick can be quickly marked.

Note: the reason the straight line has not been extended on to read up to 100 percent is that the space is more difficult to read.

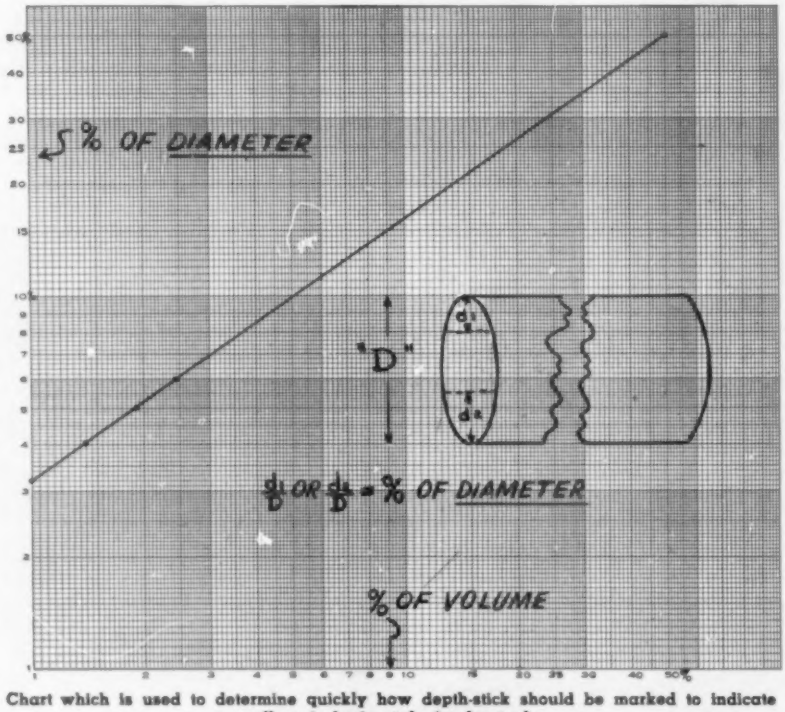


Chart which is used to determine quickly how depth-stick should be marked to indicate gallons in horizontal, circular tanks

Drain Water from Belts

AT THE NEW SAND AND GRAVEL PLANT of the Fordyce Gravel Co., Victoria, Texas, the washed aggregates are reclaimed by belts passing through tunnels under the stock piles. When the reclaiming belt is not in use considerable water drains into the tunnel. To keep this water off the belts, the operators have devised an ingenious device. The metal spout serving the belt can be tipped. To the un-used end of this spout has been welded a piece of two-inch pipe that has been shaped into a small launder. Thus when the gravel is not passing to the belt, the two-inch pipe is as shown in the illustration.

Tilting spout has pipe section welded to the end to divert water from belt when aggregates are not flowing

NEWS ABOUT PEOPLE

Appointed Sales Manager

JAY E. JELLICK, recently manager of the Portland Cement Information Bureau, San Francisco, Calif., has been appointed sales manager of the Pacific Portland Cement Co., according to an announcement by J. A. McCarthy, president of the company. Widely known on the West Coast, Mr. Jellick was formerly manager of the Pacific Coast offices of the Portland Cement Association. From 1929 to 1932 he was manager of the advertising offices of Calaveras Cement

Jay E. Jellick

Co. Mr. Jellick, a registered civil engineer, has also been with the Los Angeles County Road Department and the Wyoming State Highway Department in an engineering capacity.

Marblehead Promotions

WALLACE E. WING, formerly manager of the Hannibal plant of the Marblehead Lime Co., and for the last seven years in the company's general office in Chicago, Ill., has been promoted to assistant vice-president in charge of research and chemical supervision. Robert A. Temple, superintendent of the South Chicago plant, has been appointed operating manager of all the company's plants. Mr. Temple is succeeded by Mark E. Snyder who becomes superintendent of the South Chicago plant. Earl C. Houchins is superintendent of the Thornton, Ill., plant.

With Red Cross in Africa

STIRLING TOMKINS, president of the New York Trap Rock Corporation, has arrived safely in Africa where he will serve as assistant to the American Red Cross Delegate William Stevenson. Mr. Tomkins volunteered his services to aid in the direction of the club, recreation, hospital and welfare programs carried on by the Red Cross for the troops in North Africa. Mr. Tomkins, who has been a member of the Board of Directors and Executive Committee of the National Crushed Stone Association for a number of years, has resigned from these offices as he expects to be away from this country for an extended period.

With Fluorspar Company

MICHAEL P. CLOONAN of Cowdrey, Colo., is superintendent of the Western Fluorspar Corp., which operates in the North Park district near Cowdrey. The corporation's new mill was expected to be completed and ready for operation by the middle of June. The plant will use the new sink-float process.

Lime Consultant

W. R. CLIFFE, general superintendent and chief engineer, H. E. Millard, Annville, Penn., has resigned his position to devote his full efforts as consultant to Lime Industry Management and Engineering, Hershey, Penn.

Supt. Cement Plant

JAMES THOMAS has been made superintendent of the Kingsport, Tenn., plant of the Pennsylvania-Dixie Cement Corp.

Post-War Planning

WILLIAM L. JURDEN, formerly production manager for four of the twenty-one plants of the National Gypsum Co., has been appointed di-

William L. Jurden

rector of post-war planning for the company and is being transferred to the administrative staff, according to an announcement by Melvin H. Baker, president. Mr. Jurden, a graduate of Lehigh University in mechanical engineering, came with the National Gypsum Co. in 1938 to assist Gordon H. Tarbell, vice-president in charge of production. He assumes his new post after a year and a half as production manager. Fred Manske, production manager for the company's metal lath, rock wool, and insulation plants, will take over the supervision of the plants at Bellefonte, Penn.; York, Penn.; and Oranda, Va., which have been operated under the direction of Mr. Jurden. A fourth plant, the company's paper mill at Newburgh, N. Y., will temporarily be handled by Mr. Tarbell.

In Charge of Research

JULIAN M. AVERY has been elected vice-president in charge of research and development of Diamond Alkali Co., Pittsburgh, Penn. Mr. Avery has been director of the research and development laboratory at the company's main plant in Painesville, Ohio, since coming with the concern in 1941 from Arthur D. Little, Inc., Cambridge, Mass. Previously he spent a number of years with Union Carbide & Carbon Corp., doing work in both the United States and Europe in the development and commercialization of new products and processes.

Awarded Chemists' Medal

WALTER S. LANDIS, vice-president of the American Cyanamid Co., New York, N. Y., has been awarded the Gold Medal of the American Institute of Chemists, which is given for outstanding services to the science of chemistry. Dr. Landis developed a method for the fixation of atmospheric nitrogen by producing ammonia from cyanamid and oxidizing it to nitric acid; he was also concerned with the engineering of the first American plant for using this process, in which lime is an essential part. He likewise designed the first portable hydrogen generator for inflating military balloons, used by American forces. Dr. Landis is a graduate of Lehigh University, having also attended Heidelberg University, Germany. In 1912 he resigned as associate professor of mineralogy and metallurgy at Lehigh University to become chief technologist for the American Cyanamid Co. with whom he has been actively associated ever since. He established its first research laboratory in 1913, was made a director in 1922, and vice-president in 1923.

Mineral Wool Council

E. I. WILLIAMS, Riverton Lime and Stone Co., Riverton, Va., has been elected chairman of the general executive committee of the Mineral Wool Industry War Council, which was recently established by manufacturers of mineral wool for the purpose of developing maximum wartime efficiency in the production of insulation for both home and industrial uses. Other members of the committee are: T. C. Carter, Eagle-Picher Sales Co., Cincinnati, Ohio, secretary; H. F. Beyer, Ludowici-Celadon Co., Chicago, Ill.; L. M. Cassidy, Johns-Manville Sales Corp., New York, N. Y.; A. M. Douglass, National Gypsum Co., Buffalo, N. Y.; G. E. Gregory, Owens-Corning Fiberglas Corp., Toledo, Ohio; M. L. Kuykendall, Insulation Industries, Inc., Detroit, Mich.; C. L. Neumeister, American Rock Wool Corp., Chicago, Ill.; C. L. Newport, Coast Insulating Corp., Los Angeles, Calif.; and M. M. Stone, M. H. Detrick Co., Chicago, Ill.

Elected Vice-President

GEORGE E. GREGORY, formerly director of sales of Owens-Corning Fiberglas Corp., Newark, Ohio, has been elected vice-president in charge of commercial development. J. P. Levis, acting for Harold Boeschenstein, president, now on leave of absence with the War Production Board in Washington, also announced the recent expansion of the board of directors to include four new members. They are W. P. Zimmerman, vice-president in charge of manufacturing and sales; James Slayter, vice-president in charge of research and development; Harry R. Winkle, treasurer, and Dr. E. C. Sullivan, vice-chairman of the board of directors, Corning Glass Works.

President of Yosemite

THEODORE M. STUART, president and general manager of Yosemite Portland Cement Co., Merced, Calif., about whom an item appeared in the July issue of ROCK PRODUCTS, is a native of Iowa. He was educated in the public schools and graduated with an A.B. degree from the University of Denver and from the law school of the University of Michigan at Ann Arber with the degree of LL.B. At Michigan he was a member of two

Theo. M. Stuart

famous football teams coached by "Hurry-up" Yost; practiced law a number of years at Denver, Colo., where he specialized in railroad law. During World War I, Mr. Stuart served in the Army and located in California in 1919 where he practiced law in Fresno until 1934 when he moved to San Francisco. During more than 20 years in the practice of law in California he has participated in litigation involving important questions in water rights, constitutional law and corporation law. When the Yosemite Portland Cement Co. was formed about 1927, Mr. Stuart became an early stockholder, and for the last ten years has served as a member of the board of directors.

Resigns

WILLIAM STRINGHAM, superintendent, mining branch, Victor Chemicals Co., Nashville, Tenn., has resigned to accept a position with the Tennessee Zinc Co., Johnson City, Tenn. According to reports, this company has purchased 13,000 acres of zinc lands and will soon erect a smelter and mills.

New Lone Star Supt.

HERMAN URSPRUNG, who succeeds E. C. Champion, retired, as superintendent of Lone Star Cement Corporation plant at Nazareth, Penn., was formerly assistant superintendent. Mr. Ursprung has been identified with Lone Star for many years, and served for four years with the South American properties of the company.

Edits Gypsum News

MARTHA HILDEBRANDT has been appointed editor of the *National Gypsum News*, house organ of the National Gypsum Co., Buffalo, N. Y. She will also assist Mr. Lopes in public relations activities for the company. Miss Hildebrandt was graduated from Syracuse University with a BA in journalism. While at college she was editor of the college monthly magazine, active in radio work and was a member of Theta Sigma Phi, national women's professional journalism honorary, and Alpha Epsilon Rho, national radio professional honorary.

War Research

J. H. REICHENBACH, formerly manufacturing research engineer with the Nazareth Portland Cement Co., Nazareth, Penn., is now on the staff of the War Research Division of Columbia University.

Transferred

F. S. RICHARDS, superintendent of the San Juan Bautista, Calif., plant of the Pacific Portland Cement Co. has been transferred to Gerlach, Nev., succeeding A. H. Murdock, who is now with Caterpillar Tractor Co.

Appointed Chief Chemist

ROBERT E. KNARR, a member of the chemical laboratory staff of the Hudson, N. Y., plant of the Lone Star Cement Co. since 1934, has been appointed chief chemist at the Nazareth, Penn., plant.

Veteran Retires

EDMUND C. CHAMPION, superintendent of the Nazareth, Penn., cement plant of Lone Star Cement Corporation for the past 14 years, has retired in accordance with the retirement plan of the company. Mr. Champion has had a colorful career of 43 years in the cement business. After graduation from the University of Michigan where he obtained a Master of Science degree, Mr. Champion went to Iola, Kans., in 1900, where he helped to put into operation the first portland cement plant west of the Mississippi River to use rotary kilns. This plant was built by the Iola Portland Cement Co. (now part of the Lehigh Portland Cement Co.) and was the first cement plant to use natural gas as fuel. In those days considerable cement was shipped to California and other Pacific Coast States.

Following 11 years at Iola with the original company and with the Kansas Portland Cement Co., Mr. Champion came East and acted as superintendent of what was then Atlas Cement Company's plant at Hudson, N. Y. From 1912 to 1921 he was general superintendent of the American Agricultural Chemical Co., as general superintendent of the eastern division. He returned to the cement industry in 1921, and has been with the Lone Star Cement Corporation for the past 20 years.

It is of interest to note that with Mr. Champion's retirement, there are left only two of those who were present at the beginning of operations at the Iola plant in 1900 who are still actively engaged in the cement industry; namely, James E. Curtis, general superintendent of the Consolidated Cement Corporation, and Vernon Lemaster, treasurer, Lone Star Cement Corporation. Those who have retired, and their positions at the Iola plant when it was opened, include: Sigmund L. Wing, superintendent of construction, Coldwater, Mich.; Col. Leigh Hunt, general superintendent, Brownsville, Texas; A. T. Be Vier, shop foreman, recently superintendent, Great Lakes Portland Cement Co., Buffalo, N. Y.; Claude N. Peters, bookkeeper, recently office manager, Lone Star Cement Corporation, Asbury Park, N. J., and E. C. Champion, who was chemist of the Iola plant.

Grace M. Evans, owner and operator of Monon Crushed Stone Co., standing in the midst of her faithful workers

Grace M. Evans

Continues at the Helm

MRS. GRACE M. EVANS, formerly secretary of the Monon Crushed Stone Co., Monon, Ind., is now the owner of the business and is continuing to manage and operate it, having dissolved the business interest of the late George H. Balfe of Lafayette, Ind. Mrs. Evans has remained in active charge of the business since the death of her husband, Herman H. Evans, in 1918. Recently the company conducted very impressive flag raising ceremonies at the plant, the personnel of which numbers 45 employes.

W.P.B. Director

M. B. GARBER, expert and assistant sales manager of The Thew Shovel Co., Lorraine, Ohio, has been appointed Director of the Construction Machinery Division of the War Production Board. He has been Acting Director of the Division since April 3, 1943.

Shore Captain

CAPT. IRVING OHLEMACHER of the sandship "Hydro" has been made shore captain and dispatcher for the Kelley Island Lime and Transport Co., at Sandusky, Ohio, succeeding Clarence Hobart who joined the Maritime Service.

Heads N.I.A.A.

FREDERIC I. LACKENS, advertising manager, The Hays Corporation, Michigan City, Ind., has been elected president of the National Industrial Advertisers Association, Inc.

Protest County Competition

ANGELES GRAVEL & SUPPLY CO., Port Angeles, Wash., recently protested the use of county road equipment to gravel the Olympic Shipbuilding Company grounds. Clallam County has realized about $11,000 since December 1, 1942, for rental and sale of county equipment, according to County Commissioner E. C. Horton, who defended the practice.

Start New Quarry

A NEW QUARRY and plant has been placed in operation by the Chicago, Burlington & Quincy Railroad at Wyalusing, Wis., near Prairie du Chien, for the production of ballast. Plans call for 50,000 cu. yd. of crushed stone to be used this year for ballasting 28 miles of roadbed between La Crosse and St. Croix. Work for the entire project probably will take at least five years, and involves the major part of the Burlington roadbed between Chicago and the Twin Cities. Included in the quarry land are some 16 acres of river bluffs between the south end of Wyalusing State Park and the village of Wyalusing.

Sue O.P.A.

THE UNITED STATES GYPSUM CO., Chicago, Ill., has filed a suit in the Federal Emergency Court of Appeals against O.P.A. regulations which require the company to pay a three percent freight tax, amounting to many thousands of dollars, which the concern contends should be borne by the consumer, not by the manufacturer.

Dolomite for Magnesium

SPOKANE PORTLAND CEMENT CO., Spokane, Wash., is now operating its new quarry at Marble, Wash., for the production of dolomite used in the manufacture of magnesium by the Electro Metallurgical Co. Rock for the magnesium will be plus ¼-in. All the finer material will be crushed for agricultural liming purposes. Felix Sandoz, formerly with U. S. Gypsum Co., at the Evans plant, will be manager in charge of operations for the Spokane Portland Cement Co.

Another Cement Plant to Manufacture Lime

MANITOWOC PORTLAND CEMENT CO., Manitowoc, Wis., which recently ceased cement production with bins full, plans to resume production manufacturing high calcium lime starting August 1. About 50 percent of the normal cement plant force will be engaged in the manufacture of lime for the Marblehead Lime Co., Chicago, Ill., which has a similar arrangement to use the Peerless Portland Cement Co.'s Huron, Mich., plant.

Ohio Conference

OHIO SAND AND GRAVEL ASSOCIATION and the Ohio Ready Mixed Concrete Association held a joint business conference at Columbus, Ohio, June 24. Wm. Edward Hole, president of the sand and gravel association, presided at the morning conference, and A. W. Kimmel, president of the ready mixed concrete producers, headed up the afternoon meeting. Executive Secretary V. P. Ahearn of the National Sand and Gravel Association was on the program to discuss priorities, manpower problems, and post-war activities.

Lime Production

NATIONAL LIME ASSOCIATION latest figures on shipments and capacity of lime plants shows that the ratio, shipments to capacity, for May, 1943, was 73.0 as compared with 75.9 for April, 1943, and 66.5 for May, 1942. Tonnage shipments of lime for the month of May are as follows: chemical, quicklime 102,460, hydrate 23,645; building, quicklime 9565, hydrate, 19,410; agriculture, quicklime 3365, hydrate 20,924.

Sell Gravel Deposit

JOHN M. TOPPA has sold to James H. Dwyer of Dwyer Brothers and Fanning, contractors, his sand and gravel pits at the Hummocks in Portsmouth, Rhode Island. This contracting firm has the contract to resurface 24 of the city's streets.

To Produce Sand

C. S. POWERS, 35 Park Place, Meriden, Conn., has started up a sand plant equipped with washing and screening facilities.

Open Old Quarry

DEVELOPMENT of the old quarry at Meskill, Wash., in western Lewis county, has been started for the purpose of obtaining ballast for the main line of the Northern Pacific Railway. The quarry was operated about 30 years ago by the State of Washington with convict labor. After several years, however, it was abandoned. J. P. Carbon, Spokane, Wash., is the contractor for the work.

Slag Output Up

NATIONAL SLAG ASSOCIATION, through the Bureau of Mines, reports that the total output of air-cooled screened and unscreened, and water granulated slag for 1942 was 19,122,718 short tons as compared to 14,678,266 tons for 1941. Sales of air-cooled slag were 19 percent greater in 1942 than in 1941, and the average value was one cent lower.

During the process of crushing and screening blast furnace slag, particles of metallic iron which escape through the slag notch of the blast furnace are recovered at the slag plant by means of handpicking and magnetic pulleys. In 1942, 165,679 tons of iron was recovered or about 24 lb. of iron per short ton of slag produced.

Lehigh to Make Lime

LEHIGH PORTLAND CEMENT CO. is converting 50 percent of its cement producing facilities at Buffalo, N. Y., to the production of chemical lime. The report states that limestone for the plant will be brought down the lakes.

Close State Quarry

THE NORTH CAROLINA Highway and Public Works Commission has approved a recommendation of Governor Broughton that the commission's quarry near Elkin be abandoned after several months of experimental operation. The governor told the commission that the quarry was "a losing proposition" because of the high silica content of the rock, the quarry's small capacity, and its unfavorable location. It was opened last summer to supply rock for roadbuilding but the stone was later found to be too soft.

Sand Dredge Permit

PARKER BROTHERS & CO., INC., Houston, Texas, has applied to the War Department for a permit to begin work in dredging sand from the bed of San Jacinto river, between the mouth near Lynchburg, Texas, and a point on the river about eight miles east of Humble.

Heavy Construction Expected After War

F. W. DODGE CORPORATION anticipates a larger volume of industrial plant construction during the ten years following the war than in 1930-1939 period. The estimated increase of the post-war decade over the pre-war decade is about 30 percent in terms of 1940 dollars. Expectation of post-war demand is based upon the currently accumulating deferred demand for new plant capacity in unexpanded civilian-goods industries: food products, paper and pulp, printing and publishing, stone, glass and clay products, textiles, refrigerators and cold storage, lumber and woodworking, leather and leather-working, railroad shops, etc.

This increase is expected in spite of the tremendous war-plant construction program of the past three years. In peacetime, through prosperity and depressions, this non-war industry group invests 50 percent more annually in new plant facilities than does the war industry group. Much of the war-plant construction will be scrapped after the war as it cannot be readily adapted to peacetime uses. This is particularly true of explosives, plants for loading and assembling ammunition, and many of the shipyards.

Restricts Cement Manufacture

SEATTLE city fathers have introduced an ordinance which restricts the manufacture of cement and lime within the city limits. The first section of the proposed ordinance prohibits "cement or lime manufacturing, except the manufacture of lime from fossil shells."

Discover Quartz Pebbles

PURE QUARTZ PEBBLES have been discovered in the gravel beds of Mortar Creek in Elmore County, Alabama, according to a recent report. These pebbles are of such shape and smoothness that they compare with former French and Scandinavian importations.

Magnesium in Louisiana

MATHIESON ALKALI WORKS, INC., has started production of magnesium at its new magnesium-chlorine plant in Louisiana. Production of 50,000,000 lb. of magnesium annually is expected from this plant. The principal raw material is dolomitic stone, calcined locally using natural gas fuel. The resulting oxides of calcium and magnesium are treated with calcium chloride, a product of the parent Mathieson plant in Louisiana. The mass is then treated with carbon dioxide obtained from the calcination of the dolomite, which converts the calcium into insoluble carbonate, leaving magnesium chloride. This product, after being concentrated, is electrolyzed, forming magnesium and chlorine.

Open Up Quarry

B. L. ANDERSON, contractor, and S. P. Moors of Cedar Rapids, Iowa, has sublet a contract for crushed stone for a big naval depot in Nebraska to Concrete Materials Construction Co., Cedar Rapids, Iowa. This company has moved equipment into the old Union Pacific quarry east of Blue Springs. E. R. Wolfe will be superintendent of the plant.

Cement Pricing Practices Challenged by F.T.C.

AN ORDER has been issued by the Federal Trade Commission against the Cement Institute and 75 member companies to "cease and desist" from price practices which, the commission alleged, constitute unfair methods of competition. The order involved the so-called multiple basing-point delivered price system. The commission said, "The records of cooperative activity among cement producers show that the cement industry has evidenced a strong aversion to free competition," the commission said, "and that its members have, by understanding and agreements, developed and maintained a substantial uniformity of action among themselves with respect to practically every marketing procedure which involves price or other competition. . . .

"Long pursued restraints of competition have contributed to, if not created, the belief now generally held by the respondents that free and open competition is impracticable for the cement industry and have fostered among the respondents philosophy of seeking not to exceed others in quality or price or in affording terms of sale that would be more attractive to purchasers."

S. W. STOREY, president of the Cement Institute, commenting on the order, is reported to have said that it "threatens complete disruption of the delivered price method of marketing employed by practically all industries in direct response to consumer demand." Mr. Storey further stated that "this is merely a new attack by government bureaus seeking to bring up questions that already have been settled by Congress and at least once by the Supreme Court of the United States."

The F.T.C. ordered the respondents to "cease and desist" from such alleged practices as:

1. Using the multiple basing-point delivered-price formula; refusing to sell cement at the mill at the base price; refusing to allow purchasers to provide transportation.

2. Quoting, as f.o.b. mill prices, figures which, the commission said, actually represent a delivered price minus shipping charges from some mill other than the actual shipping point.

3. Selling at prices which are calculated by using the charges of a common carrier higher than those of a lower-priced carrier actually used.

4. Selling cement to the government or its agents on terms which deprive the government of benefits of land-grant or other special common carrier rates.

5. Exchanging information concerning common carrier charges for cement to be used in determining cement prices.

6. "Controlling or attempting to control the destination or use of cement after the acquisition of title thereto by the purchaser."

7. Classifying customers and determining projects for which sales of cement will be made.

8. Threatening to discontinue sales to customers who deal in imported cement and "maintaining any form of espionage for the purpose of determining whether or not their customers purchase or deal in imported cement."

9. Discriminating in price between customers.

Court review of the Federal Trade Commission "cease and desist" order directed against selling practices of cement manufacturers was sought in a petition recently filed with the United States Circuit Court of Appeals at Chicago. The Cement Institute and 59 member companies asked invalidation of the order issued July 23 as "unauthorized and without foundation in law or in fact."

Crushed Stone Production Increased in 1942

CRUSHED STONE PRODUCTION in the United States in 1942, reported to the Bureau of Mines, amounted to 194,537,030 short tons valued at $188,300,436, an increase of seven percent in quantity and eight percent in value compared with 1941. Included in this total is stone sold or used for concrete aggregates, railroad ballast, riprap, agricultural limestone, refractory stone, stone for metallurgical use (flux), limestone sand, alkali works, calcium carbide works, sugar and glass factories, paper mills, and in various other chemical and manufacturing processes. Stone used in the manufacture of lime, cement, and asphaltic stone, and slate used for granules and flour are not included in this total.

Stone used for concrete aggregates and railroad ballast constituted 64 percent of the industry in 1942; 125,267,650 short tons valued at $116,394,778. Production by commercial companies increased 27 percent in 1942 compared with 1941, whereas production by government agencies declined 55 percent. Crushed stone for metallurgical purposes, 30,262,910 short tons valued at $24,152,113, increased 10 percent in quantity and 20 percent in value. Limestone for agricultural use, 13,745,400 short tons valued at $16,993,254, increased 15 percent in quantity and 18 percent in value. Refractory stone (ganister, mica schist, dolomite, and soapstone) amounted to 2,718,090 short tons valued at $3,999,929, an increase of 21 percent in quantity and 22 percent in value.

County Buys Stone

THREE CONTRACTS for crushed stone were recently awarded for the maintenance of county highways by the commissioners who met at Bedford, Ind. Bids accepted by the commissioners were: Zelbert Hawkins, $1.69 per cu. yd. from Clements quarry; H. V. Sutton, $1.48 per cu. yd. at Baker quarry; and Homer George, $1.55 per cu. yd., at the George quarry.

Asbestos Cement Conduit

THE PHILIP CAREY MANUFACTURING Co., Cincinnati, Ohio, is making a new asbestos-cement conduit; intended principally for cable installation. A feature of the conduit is the "Flexcaulk" coupling. This coupling comprises a tubular housing of tough, rigid, blow-resisting asbestos-cement, to which is bonded a liner of mineralized asphalt compound, formed into a barrier-type, tapered liner. It is said to permit a flexible, self-aligning, water-tight joint when properly assembled with a special, joint-sealing compound.

Wins Dredge Boat Decision

KELLEY ISLAND LIME & TRANSPORT Co., Cleveland, Ohio, has won a judgment for $71,188.81, plus interest since January 1, 1940, against the City of Cleveland, the Western Foundation Co., the Standard Accident Insurance Co., and the L. A. Wells Construction Co. for damages resulting from the sinking of its sand barge, the Hydro, in the Cuyahoga River, plus the cost of raising of the barge. The allegation of the libelant was that the city was dismantling the Columbus Road Bridge and that parts of the bridge had lodged in the river. The Hydro, loaded with sand, struck a submerged obstruction which was part of the bridge and received damages which caused it to sink.

California Dolomite

OUTPUT of dolomite in California in 1942 totaled 142,552 net tons valued at $413,469 and came from two properties in Monterey County and one each in Inyo, Los Angeles, Riverside, San Benito, and Tuolumne counties; also but not included in the above figures was a tonnage of dolomite from Tuolumne County that was burnt for lime and therefore included in the lime figures. The 1942 production was the largest annual yield on record in this State. The 1941 production amounted to 22,300 tons worth $64,595. Material shipped during the year was utilized for magnesium metal, for steel furnace flux and refractories, stucco dash, terrazzo, kalsomine, poultry grit, artstone, mineral wool, and for the manufacture of carbon dioxide.

Needs Quartz Crystals

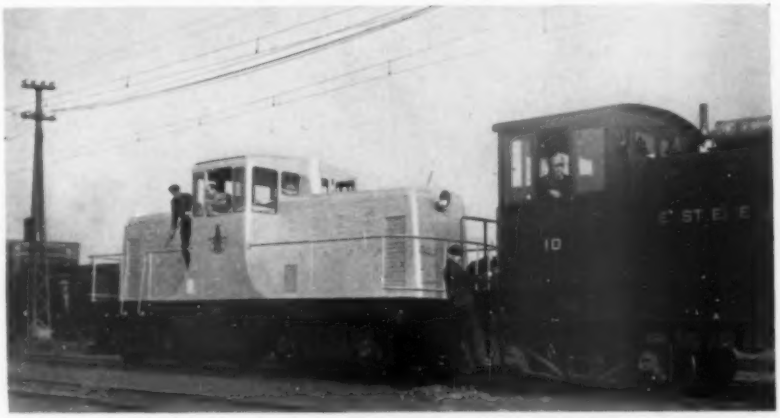
WAR PRODUCTION BOARD has sent out an appeal to all owners of mineral deposits containing quartz crystals to get in touch with the Miscellaneous Minerals Division, W.P.B., Temporary "R" Building, Washington, D. C. Samples of the best crystals should be sent to this office. These crystals are needed for the manufacture of quartz oscillator plates used in radio equipment for the armed forces. At present practically all of the quartz used for this purpose comes from Brazil. The Miscellaneous Minerals Division wants only separate individual crystals—clusters, groups or grainy masses won't do. Each crystal must weigh at least half a pound, be at least an inch thick and three inches long. It must be clear and colorless on the inside, although light smoky quartz can be used. However, milky quartz, rose quartz and purple quartz are useless.

Gypsum "Essential"

OWING to the large volume of gypsum products, such as wall-board, which are going into war construction, the War Manpower Commission has placed the gypsum industry on the certified list as essential to the war.

Change Name

J. J. HARRINGTON has become the sole owner of Ludke Bros.-Harrington Co., Auburn, N. Y. This company produces sand and gravel.



Permanente Corporation, San Jose, Calif., has placed in service at its big cement plant the 65-ton, 400-hp. G.E. Diesel-electric switching locomotive

Lime Association Safety Contest

FIFTY-EIGHT plants were enrolled in the 1942 National Lime Association contest which was conducted by the Bureau of Mines, 10 more than in 1941. The Bakerton plant of The Standard Lime & Stone Co., had the best safety record in 1942, working 220,286 man-hours without a disabling injury. This plant at Bakerton, W. Va., captured first honors in 1941.

Ten plants operated throughout the year without disabling injuries and were awarded Certificates of Honor by the National Lime Association. The following plants received certificates:

Bakerton plant, Bakerton, Jefferson County, W. Va., operated by The Standard Lime & Stone Co., worked 220,286 man-hours.

North American lime plant near Martinsburg, Berkeley County, W. Va., operated by the North American Cement Corporation, worked 194,071 man-hours.

Asbury plant, Knoxville, Knox County, Tenn., operated by The Standard Lime & Stone Company, worked 122,805 man-hours.

South Chicago plant, South Chicago, Cook County, Ill., operated by the Marblehead Lime Co., worked 100,285 man-hours.

Superior plant, Pelham, Shelby County, Ala., operated by the Superior Lime & Hydrate Co., worked 47,720 man-hours.

Marblehead plant, Marblehead, Adams County, Ill., operated by the Marblehead Lime Co., worked 44,535 man-hours.

Waianae plant, Honolulu, Honolulu County, T. H., operated by the Hawaiian Gas Products, Ltd., worked 44,236 man-hours.

Newala plant, Newala, Shelby County, Ala., operated by Newala Lime Works, worked 36,149 man-hours.

LeRoy plant, LeRoy, Mower County, Minn., operated by Fowler & Pay, worked 23,589 man-hours.

New Haven plant, New Haven, Addison County, Vt., operated by the Green Mountain Lime Corp., worked 15,005 man-hours.

Pressure Asbestos-Cement Pipe

THE RUBEROID CO. has brought out a new product of asbestos-cement known as the "Eternit" A/C pressure pipe. This type of pipe is created by a patented extrusion process which, in addition to providing density and strength, is said to insure uniform measurements and smooth surfaces, both inside and out, without machining. It is made in standard lengths of 13 ft. and in diameters up to and including 6 in.

Lime Plant to Be Sold

DETROIT LIME AND CHEMICALS CORPORATION, Detroit, Mich., has announced through R. E. Flynn, president, that the plant is for sale. The plant has been idle since April 15 this year.

Loading gypsum rock into cars in the mine of the National Gypsum Co., at Sun City, Kans. The Traxcavator loader handles 35 tons per hour

Funds Provided for Post-War Highway Construction

PUBLIC ROADS ADMINISTRATION in cooperation with the state highway departments have available $50,000,000 for surveys, plans and specification for post-war projects. The money is made available by a recent amendment to the Federal Aid Highway Act. The sum of $10,000,000 is made available for rehabilitation of roads substantially damaged by the army, navy or other government agency, including contractors employed by the government in the prosecution of the war or in national defense. The sum of $27,500,000 is made available for access roads to sources of critical war materials. The $50,000,000 for post-war planning is apportioned as follows:

Alabama	$ 1,073,685
Arizona	737,698
Arkansas	879,398
California	2,052,843
Colorado	920,452
Connecticut	318,057
Delaware	250,000
Florida	736,147
Georgia	1,287,986
Idaho	634,020
Illinois	2,020,185
Indiana	1,232,715
Iowa	1,275,186
Kansas	1,293,058
Kentucky	955,360
Louisiana	762,633
Maine	444,348
Maryland	415,242
Massachusetts	670,583
Michigan	1,556,139
Minnesota	1,380,023
Mississippi	919,522
Missouri	1,519,138
Montana	1,037,280
Nebraska	1,020,507
Nevada	654,359
New Hampshire	250,000
New Jersey	651,596
New Mexico	829,669
New York	2,469,884
North Carolina	1,235,019
North Dakota	765,365
Ohio	1,802,996
Oklahoma	1,162,017
Oregon	849,827
Pennsylvania	2,093,567
Rhode Island	250,000
South Carolina	693,473
South Dakota	804,186
Tennessee	1,086,546
Texas	3,252,287
Utah	576,142
Vermont	250,000
Virginia	936,400
Washington	807,890
West Virginia	563,183
Wisconsin	1,231,947
Wyoming	638,436
Hawaii	250,000
District of Columbia	250,000
Puerto Rico	253,006
Total	$50,000,000

The same amendment of the Federal Aid Highway Act provides:

(1) Approximately $170,000,000 of unobligated balances of Federal aid highway funds apportioned to the states shall continue to be available for the duration of the war and one year thereafter.

(2) Inclusion of the cost of acquisition of rights-of-way as part of construction costs. Under this provision the states and the Federal Government will share in the cost of highway rights-of-way.

(3) A survey of the need for a system of express highways throughout the United States; number of such highways needed; approximate routes and approximate cost of construction and a report to the President and Congress within six months.

Diesel Nozzle Tester

THE BUDA CO., Harvey, Ill., is marketing a simple, easy-to-use Diesel nozzle tester. It is 10¾-in. high and weighs only 12-lb., and can be fastened to any suitable workbench

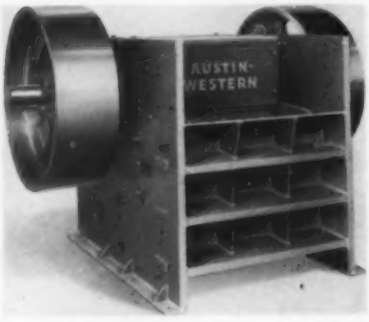
Easily operated Diesel engine nozzle tester

or table for accurately testing, cleaning and adjusting all types of nozzles.

There are six steps involved in using the tester: 1. Secure tester in position and fill reservoir with clean engine fuel; select correct adapter to fit nozzle and attach both to tester. 2. Close hand valve tightly and insert lever bar in socket lever hole. 3. Vigorously pump lever bar several times to flush fuel through nozzle to remove foreign matter and dirty fuel. 4. Open hand valve and pump up pressure to determine from gauge if nozzle's fuel charge is occurring at the correct pressure. 5. If nozzle is not operating efficiently, it must be adjusted by simply loosening the lock nut which holds the pressure adjusting screw and then readjusting the screw to the desired point at which the nozzle allows passage of fuel charge at desired gauge pressure, correcting pressure readings indicated on gauge. 6. After nozzle has been flushed clean, tested or adjusted, it is ready for immediate use.

Equip Jaw Crusher with Large Roller Bearings

AUSTIN-WESTERN ROAD MACHINERY Co., Aurora, Ill., has brought out an improved line of jaw crushers with



Jaw crusher which can be quickly adjusted to make different size products

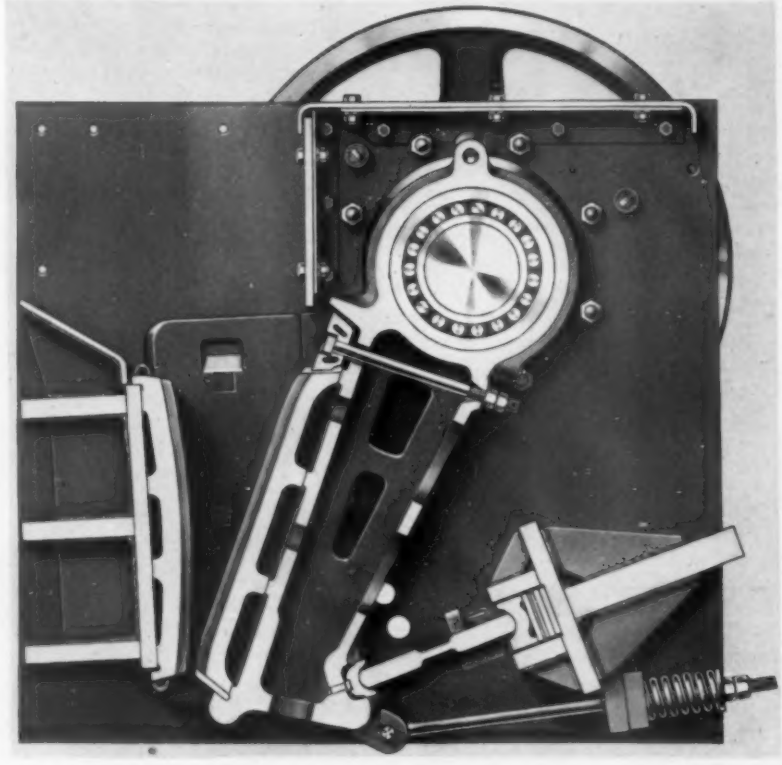
over-size shafts and roller bearings. Jaws have been made deeper and the crushing angle thus formed is smaller. Under these conditions higher speed is an advantage as the unit crushes faster with extra strokes and the nipping action of the jaws is said to be more positive. It also is claimed that at higher speed, there is less oversize in the crushed product and some stone is broken by impact to further step up capacity without increasing the load on the machine. It is a comparatively simple matter to make adjustments for different sizes of products.

Construction Details of Crusher

As shown in the cross-section view, the overhead eccentric design, with a larger shaft and well located toggle, imparts a generous horizontal stroke at the top and bottom ends of the moving jaw, permitting the crusher to do more work. The force-feed, downward rolling action of the deep jaws forms a smaller crushing angle, keeps the stone on the move and the crushing operation steady.

The large SKF roller bearings are self-aligning, they reduce power consumption, and save on lubrication and maintenance. Bearings are sealed against the loss of lubricant or the entrance of dirt.

Jaw crusher frames are fabricated from hot rolled, high carbon steel plates which are morticed and securely welded together by using triple-pass welds. Similar welding practice joins all abutting edges of the cross members. Jaws and cheek plates are made of manganese steel. Jaws are reversible.



Cross-section of jaw crusher to show overhead eccentric design, larger shaft, well-located toggle, and roller bearings

SLY DUST CONTROL

SALES AND ENGINEERING DATA

SLY AUTOMATIC-CONTINUOUS DUST FILTERS

No. 68 Type 360 Sly Dust Filter for AUTOMATIC-CONTINUOUS Operation. This Sly Dust Filter is in use in the "Finish Mill" of a cement plant, for controlling the dust from –
a Feed Bin
a Tube Mill
a F.K. Pump Hopper
an Elevator
a Fines Conveyor
a Tailings Conveyor

Uninterrupted 24-hour-per-day operation – automatic.

The above photograph shows the following equipment and features:

(1) Cloth bag Dust Filter with motor shaker drive at each end
(2) Access door to inside of filter
(3) Two dust hoppers with continuous discharge valves
(4) Motor drive with sprockets and chain for continuous valves
(5) Dust spouts for continuous return of dust to flow of material
(6) Clean air ducts with motor operated dampers for alternately shutting off one or the other dust filter section
(7) Safety relief door
(8) Clean air pipe to exhaust fan inside of building
(9) Standard support with walkway and railing around dust filter

The clean air duct with dampers may be attached to side or top of filter.

THE W. W. SLY MANUFACTURING CO. CLEVELAND, OHIO | DATE Nov. 12, 1941 | NO. 82-L

More than 5,000 Sly Dust Control installations in successful operation.

In the rock products field many processes requiring dust control are continuous. For these conditions the Sly Automatic Continuous Dust Filter is highly satisfactory. ★ The data sheet (above), showing an installation for a large cement plant, gives some features of the equipment. If you will write us fully about your conditions, we shall be glad to tell you exactly what can be accomplished.

THE W. W. SLY MFG. CO. • 4746 TRAIN AVENUE, CLEVELAND, OHIO

Hard-Facing Alloys

STOODY COMPANY, Whittier, Calif., has announced the development of two new hard-facing alloys of cobalt, chromium and tungsten, known as Stoody 1 and Stoody 6. Both are furnished as welding rods for application by the oxy-acetylene process.

Samples of two new hard-surfacing welding rods

The harder of the two alloys, Stoody 1, is said to provide high resistance to abrasion, corrosion and heat. It is specially recommended for hard-facing pump sleeves, wood saw teeth, carbon scrapers, wire guides, expeller parts, and similar types of equipment.

Although not quite so hard as Stoody 1, the other alloy, Stoody 6, is much more ductile and provides greater resistance to impact. Stoody 6 is especially useful for hard-facing high pressure, high temperature valves, gasoline and Diesel exhaust valves, various types of dies, shear blades, cams, etc.

Both Stoody 1 and Stoody 6 are supplied in 1/8, 3/16, 5/16, and 3/8-in. rod diameters and in lengths up to 14 in.

Reducer-Type Transmission

REEVES PULLEY CO., Columbus, Ind., has brought out a reducer-type transmission which consists of the standard variable speed transmission with a built-in speed reducer. An advantage claimed for this drive is that far less mounting space is needed to obtain the lower range speeds which formerly required the use of auxiliary speed reducing equipment.

This unit is available in two enclosed designs, horizontal and vertical, which may be mounted in any convenient or desired position. Each design is available in a wide range of speeds and in capacities from 1 to 7½-hp. inclusive. The transmission in various sizes produces ratios of speed variation from 2:1 through 12:1, and the reduction gears provide ratios up to and including 6.9:1. Speed changes are effected by turning a handwheel or, if completely automatic regulation is desired, it is available by mechanical or hydraulic methods.

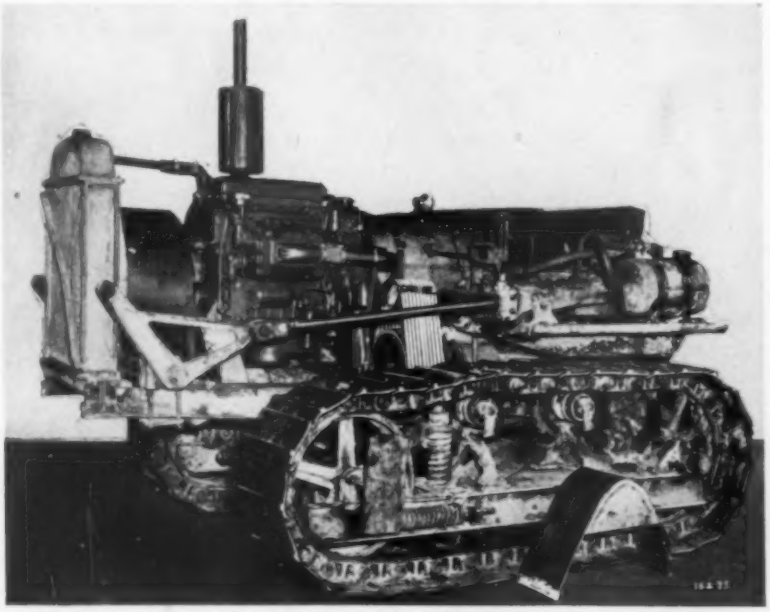
Helical type gear reducer is used in this transmission

Tractor Gas Engine Replaced by Diesel

THE GATES RUBBER CO., Denver, Colo., recently described in its house organ how a tractor's motive power was modernized by replacing an old gasoline engine with a Diesel by the use of a Gates Vulco rope drive. The gasoline motor on this 15-year-old tractor was practically beyond repair.

As a replacement engine was not available, it was suggested that the old gasoline motor be pulled out and a new Diesel installed. However, the old gasoline engine operated at 600 r.p.m., while the Diesel had a speed of 1200 r.p.m. As shown in the illustration, the 2 to 1 speed reduction in a limited space was solved by using the rope drive.

Diesel engine consumes only half as much fuel as the old gasoline engine.



Rope drive makes possible the replacement of old gasoline engine in tractor with a new Diesel engine

Enclosed Type Motors

GENERAL ELECTRIC CO., Schenectady, N. Y., has brought out a new line of totally enclosed motors of the so-called Tri-Clad type. Available in both the polyphase, 60-cycle, induction type and the single-phase, 60-cycle, capacitor type, the new motors are especially designed for use under conditions where abrasives, chemicals and excessive dirt are encountered.

Totally-enclosed polyphase induction motor

The polyphase motors are furnished in frame sizes 203 to 225. They include ½, ¾, and 1-hp. at 900 r.p.m.; ¾, 1, and 1½-hp. at 1200 r.p.m.; 1, 1½, and 2-hp. at 1800 r.p.m.; and 1½ and 2-hp. at 3600 r.p.m.

Barber-Greene Representatives
AT YOUR SERVICE

B-G representatives can be of valuable assistance to you during the present emergency. **PARTS** Many carry in stock the B-G repair parts most frequently required. Others can assist you in ordering parts. **MAINTENANCE** They will gladly advise you on general maintenance. Many are equipped to bring your machine in and completely overhaul it. **RENTAL** B-G representatives are glad to assist you in locating machines for rental or will assist you in renting a machine which you have idle. **ENGINEERING SERVICE** Your B-G representative will gladly give you the benefit of his experience in any proposed changes in your material handling layout. **NEW MACHINES** New Barber-Greenes are not available except on very high priority. If you are planning a job which will carry such a priority, your B-G representative will give you every possible assistance.

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BIRMINGHAM CAMBRIDGE CHICAGO
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42-4

DREDGING

Remove Overburden by Pumping

Fordyce Gravel Company Operates six plants in Texas, all busy on war contracts

By WALTER B. LENHART

C. F. Brugman, superintendent

FOR OVER 14 YEARS the Fordyce Gravel Co. has operated in South Texas. Today plants are located at San Patricio (San Patricio County), Carrizales spur and Havana spur in Hidalgo County, Starco spur in Starr County and two plants at Victoria in Victoria County, all in the state of Texas. This company ranks among the largest producers of sand, gravel and ballast in Texas. The main offices are in San Antonio, Texas.

General view of Victoria, Texas, plant showing how crusher product is returned to main conveyor belt

Three vibrating screens and three sand cones over concrete ground storage bins at Saxet, Texas, plant

The two plants at Victoria are operated as the Victoria plant (three years old), and the Saxet plant was placed in operation in February of this year.

The Victoria plant produces about 20,000 tons per month as a yearly average. This plant and the Saxet plant, however, have recently operated 20 hours per day, working two 10-hr. shifts. This is all defense work as South Texas has a host of Army, Navy and other training camps of all kinds. It is expected that the demand will continue for the rest of the year at least.

Use Dredge Pump for Removal of Overburden

Both of these plants have pump dredges, but the Victoria plant has a novel method of operating in that they use a 10-in. Amsco pump dredge for removing overburden and a second 8-in. dredge for delivery of gravel to the plant.

The deposit is located in and adjacent to an old river bed which overflows with every period of high water so that the surface most of the year is too soft to hold up the conventional types of stripping units. There is about 14-ft. of overburden—a black gumbo soil, free from sand or gravel. The water level is about 4- to 5-ft. from the surface.

The stripper dredge pump, operated by a 13,000 Caterpillar, pumps the debris off to one side but back into a worked out part of the pit. Delivery is at low head. The suction pipe has a cutter. The 8-in. pump is driven by a 210-hp. Cummins gas engine. The hoists on both dredges use G. E. motors and controls.

A second novel feature at this busy plant is that there is no dewatering device at the plant. The sand and gravel is simply discharged into a pile near the plant where the excess water drains away. The material is then cast into a plant hopper by a P. & H. dragline using a 2-cu. yd. Hendrix perforated bucket.

Only one size of gravel is produced at a time and it is loaded direct to gondolas as produced as there are no stockpiles or truck deliveries.

The flow is very simple. Conveyors deliver to a 4- x 12-ft. Simplicity double-deck screen. Oversizes go to a 14- x 36-in. Gruendler crusher which, via another belt conveyor, delivers back to the main belt serving the screen. The product of the screen (gravel) goes to the gondola freight cars and the sand, via simple cones, likewise goes to the cars. About 17 percent of the gravel is crushed. The bed of gravel as now recovered is 28-ft. thick and runs about 50 percent sand and 50 percent gravel.

The plant is driven by individual electric motors with power generated by a Waukesha motor, direct-connected to a generator set.

Surplus sand that accumulates around the plant is pumped away by 6-in. Morris pumps driven by a Caterpillar engine.

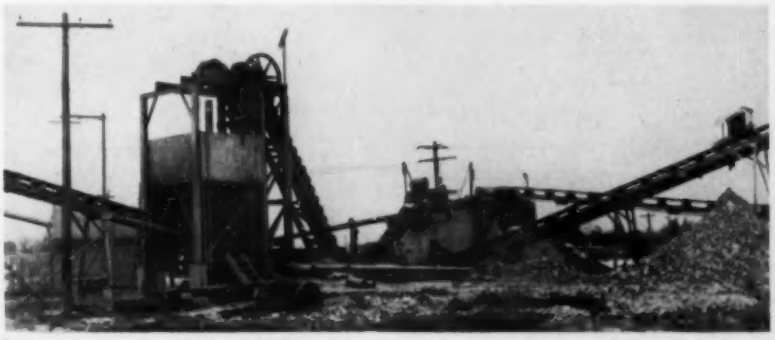
All engines at the Victoria and Saxet plants are driven by natural gas.

Saxet Plant

This plant went into operation in February of this year. It has a capacity of 200 tons per hour and is equipped to ship by rail and by trucks. At this operation trucks handle shipments up to 30-mile hauls.

Stripping is done by Koehring and P. & H. draglines. The overburden is shallow, ranging from 3- to 6-ft. Recovery of the gravel is by a 12-in. Amsco pump driven by a 400-hp. Allis-Chalmers motor. There is also available a second 12-in. pump driven by a 400-hp. motor. This dredge is now in its fourteenth year of active service. The equipment is mounted on pontoons. Electric power for the dredge and plant is furnished by three 250 k.v.a. Chicago Pneumatic natural gas engines.

Dredge at the left is removing overburden and returning it to the worked out portion of the pond



Dewatering elevator to the left, and to the right, rotary screen for dewatering dredge product and removing oversize

The pump delivers to a concrete sump serving a rotary de-watering screen. Oversize (plus 2-in.) is crushed in a 6-in. Allis-Chalmers gyratory crusher. The minus 2-in. material all goes to a second concrete sump where it is elevated by a large capacity de-watering elevator. (The buckets are perforated.) The material then falls to feeder bin serving a 30-in. inclined Goodyear belt conveyor provided with Chain Belt idlers that delivers to the screening plant.

Sizing is done on three 4- x 12-ft. Tyrock vibrating screens and in three sand cones. The products all fall to ground storage pockets. Each pocket (there are seven pockets for gravel and two for sand) has a concrete wall for keeping the sizes separate. Pea gravel is prepared on a Universal screen.

Reclaiming is by belt conveyor reclaiming tunnel. Gravel, before loading, is given a final rinse on a vibrating screen. At this point materials can drop to gondolas below or be sent by belt conveyor to steel bins for truck deliveries.

Water is supplied from artesian and

Rinsing screen at carloading point

surface sources by two 8-in. pumps driven by Allis-Chalmers motors.

Official personnel includes: R. W. Briggs, president; R. W. Spaulding, vice-president; R. H. Klossner, secretary-treasurer; C. F. Brugman, superintendent, and R. L. McMillan, engineer.

Cement Production Above Five-Year Average

BUREAU OF MINES reports that the downtrend in production of finished portland cement continued at an accelerated date in May. Output of 12,384,000 bbl. during the month was 23 percent below May, 1942, and was only 10 percent above April, 1943, a much less than seasonal gain. However, production was at a relatively high level as shown by the fact that output during May, 1943, was 18 percent above average May output of the 1935-39 period. Shipments from mills during May totaled 12,075,000 bbl. or 26 percent below May, 1942, and also showed a contraseasonal decline from April, 1943. The effects of seasonal influences at this time of the year are indicated by the 21 percent gain shown in average May shipments over average April shipments in the 1935-39 period. As production exceeded shipments, stocks of finished cement on May 31 advanced slightly from April 30 to a total of 22,888,000 bbl.

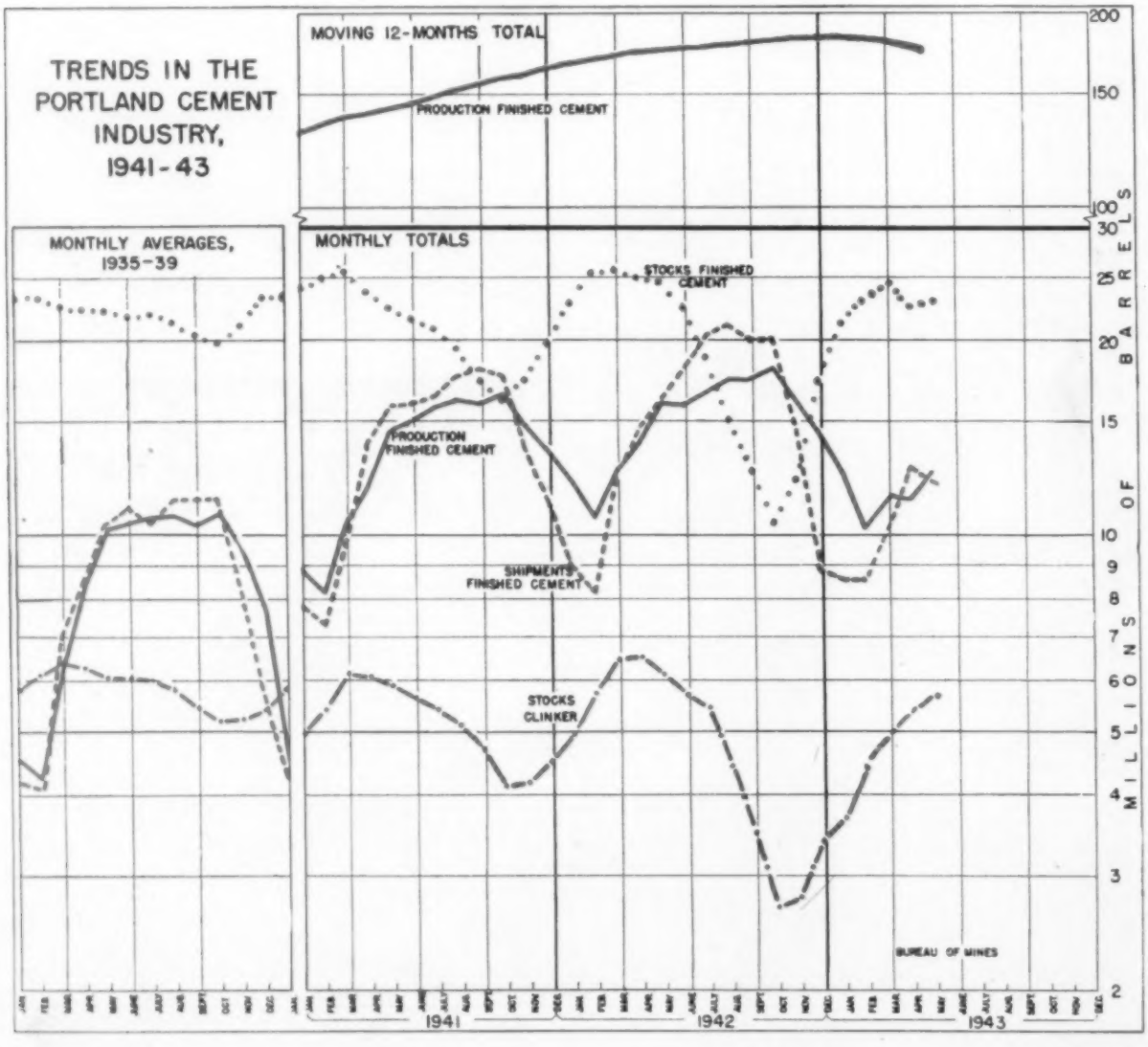
The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of May, 1943, and of May, 1942:

Ratio (percent) of Production to Capacity

	May 1942	May 1943	Apr. 1943	Mar. 1943	Feb. 1943
The month..	77.0	59.0	55.0	54.0	54.0
12 months...	71.0	70.0	72.0	73.0	74.0

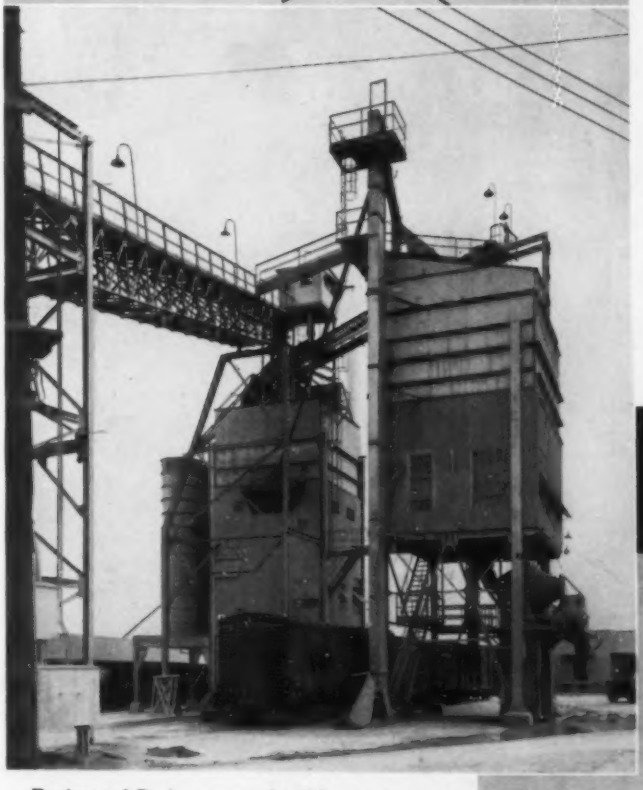
Wins Salvage Flag

RICHARD A. DITTMAR, superintendent of the Universal Atlas Cement Co., Hudson, N. Y., plant, has been active in salvage work for the war effort. The Columbia County Industrial Salvage Committee, of which he is chairman, has been awarded the salvage flag by the War Production Board in recognition of the county committee's excellent cooperation in the salvage of materials for war use.



VERSATILITY PLUS!

TRANSIT-MIXED CONCRETE PRE-MIXED CONCRETE ASPHALT-COATED SHELL SAND GRAVEL SHELL CEMENT ASPHALT SALT	LOADED INTO	TRUCK MIXERS AGITATORS BATCH-TRUCKS RAILROAD CARS



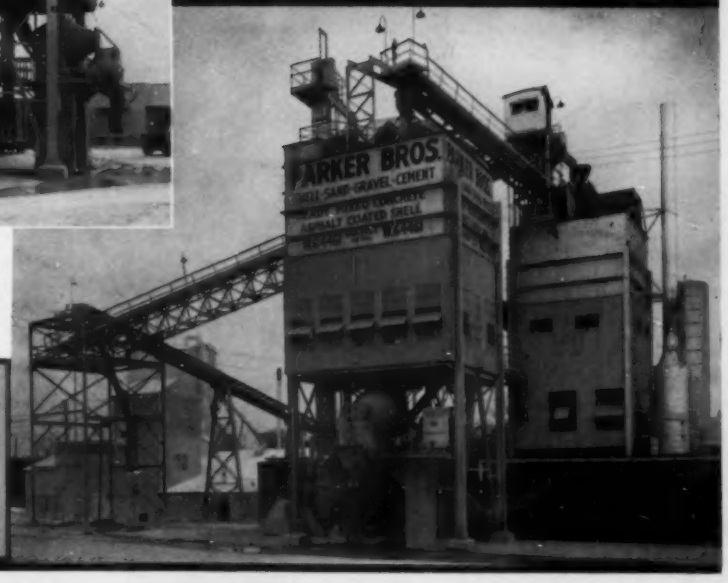
Texans have a reputation for doing things on a grand scale. No exception is the Parker Brothers plant at Houston — one of the largest, and certainly the most versatile, in the U. S.

Nearly a year was spent making layouts of the proposed plant, but none was satisfactory. Then a Butler engineer was called in. This amazing plant was the result — one that will literally do everything but mind the baby!

A complex conveyor network transports materials from barge, railroad, and truck to storage pits and mixing plants. One conveyor even delivers material to a customer next door! The mixing plants, too, are neither small nor simple; the 409 yard concrete mixing plant alone stores ten materials, an additional eight being handled by the 303 yard shell mixing plant.

The plant's astonishing list of products clearly indicates its versatility, and its compact yard and efficient operation attest to the careful planning of its layout. Little wonder that this, another Butler Engineered Design, is one of the nation's truly outstanding plants.

BUTLER BIN COMPANY WAUKESHA, WIS.



Engineered Design means the difference between "just another plant" and one that is outstanding. Large or small, simple or complex, submit your plant problems to Butler engineers. Write today for literature.

Engineered BUTLER *Design*

Accident Rates Decline in Sand and Gravel Industry

National Sand and Gravel Association Safety Contest reveals improved safety record

BOTH frequency and severity accident rates declined in 1942, according to figures compiled by the Bureau of Mines in the National Sand and Gravel Association safety competition. Sixty-eight sand and gravel plants, located in 24 States, participated in the 1942 contest. The average number of man-hours worked per plant was higher than in 13 previous years with the exception of 1929. The accident-severity rate of the contesting companies was 2.058, a reduction of 49 percent from the 1941 rate of 4.027.

Two trophies, provided by ROCK PRODUCTS magazine, will be awarded; one to the Alameda dry-bank plant of the Consolidated Rock Products Co., Alameda, Calif., for the best record among plants working 100,000 or more man-hours, and the other trophy to the No. 7 wet-pit plant operated by the American aggregates Corporation, Logansport, Ind., for the best record of plants operating less than 100,000 man-hours. The Consolidated Rock Products Co. plant worked 147,161 man-hours in 1942 with three disabling injuries that caused 10 days of disability. The American Aggregates Corporation had a record of 80,994 man-hours without a disabling injury. Twenty-eight plants of the 68 enrolled in the contest had accident-free records. The plants and their records follow:

Circleville wet-pit plant, Circleville, Pickaway County, Ohio, operated by The Sturm & Dillard Co., worked 52,119 man-hours.

Orange dry-bank plant, Orange, Orange County, Calif., operated by the Consolidated Rock Products Co., worked 51,305 man-hours.

Fort Jefferson dry-pit, wet-pit plant, Fort Jefferson, Darke County, Ohio, operated by the American Aggregates Corporation, worked 46,295 man-hours.

Urbana wet-pit plant, Urbana, Champaign County, Ohio, operated by the American Aggregates Corporation, worked 43,297 man-hours.

Boonville dry-bank plant, Boonville, Oneida County, N. Y., operated by the Eastern Rock Products, Inc., worked 42,387 man-hours.

Broad Ripple wet-pit plant, Indianapolis, Marion County, Ind., operated by the American Aggregates Corporation, worked 41,406 man-hours.

Portland dry-bank plant, Portland, Northampton County, Pa., operated by the Portland Sand & Gravel Co., worked 39,233 man-hours.

Sterling Creek wet-pit plant, E. Frankfort, Herkimer County, N. Y., operated by the Eastern Rock Products, Inc., worked 36,772 man-hours.

Illinois-Wisconsin dry-bank plant, South Beloit, Winnebago County, Illinois, operated by the Illinois-Wisconsin Concrete Pipe Co., worked 36,351 man-hours.

Wyoanna dry-bank plant, Falls, Wyoming County, Pa., operated by the Wyoming Sand & Stone Co., worked 34,566 man-hours.

Akron wet-pit plant, Akron, Summit County, Ohio, operated by The Rubber City Sand & Gravel Co., worked 34,226 man-hours.

Erie lake plant, Erie, Erie County, Pa., operated by the Erie Sand and Gravel Co., worked 33,124 man-hours.

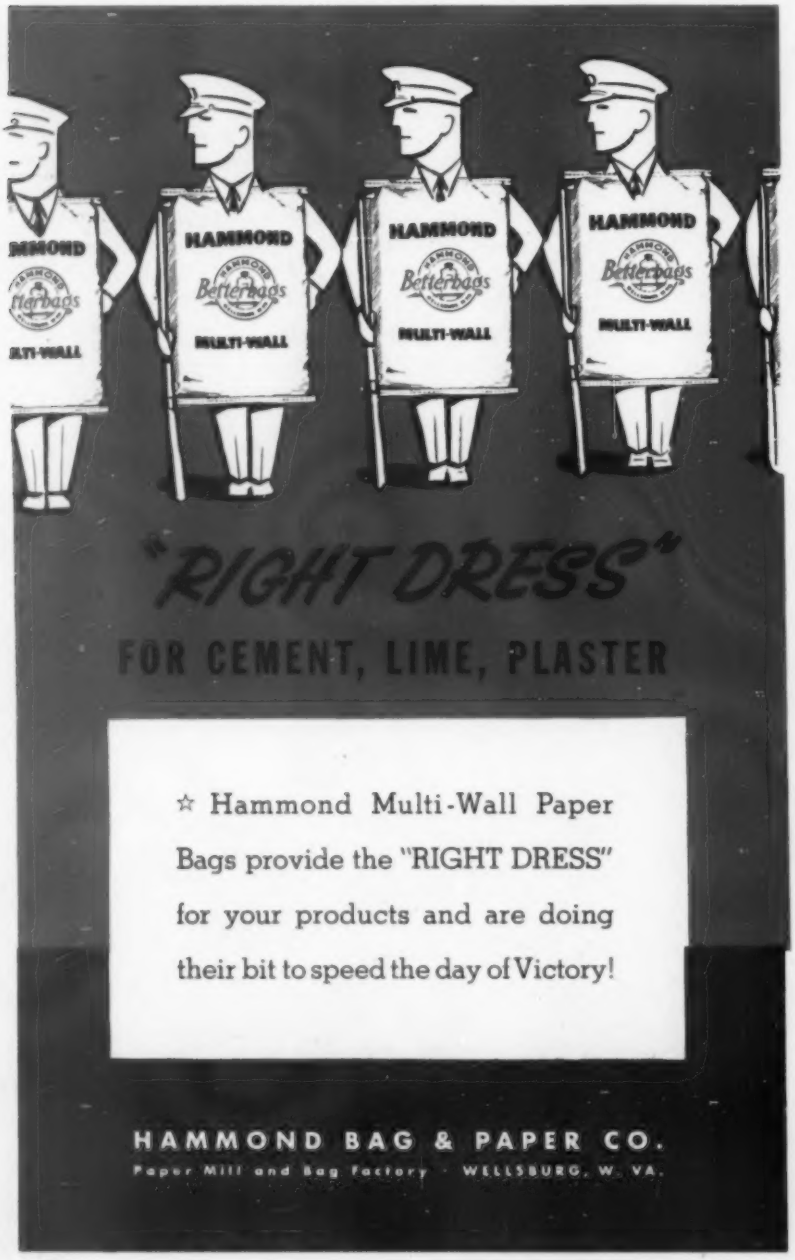
Missouri river plant, Kansas City, Jackson County, Mo., operated by the Stewart Sand & Material Co., worked 28,927 man-hours.

Steubenville river plant, Steubenville, Jefferson County, Ohio, operated by The River Sand Co., worked 22,047 man-hours.

Trenton dry-pit plant, Barneveld, Oneida County, N. Y., operated by the Eastern Rock Products, Inc., worked 16,697 man-hours.

Bedford wet-pit plant, Cleveland,, Cuyahoga County, Ohio, operated by The

(Continued on page 55)



Extra Heavy Hard-Facing Deposits *Without* EXTRA WORK!

EQUIPMENT THAT WEARS as much as ½" to 1" undersize before losing efficiency requires an extra heavy deposit of hard metal to insure the greatest possible uninterrupted service. To obtain a deposit ⅜" thick using coated rods the welder must apply two layers of metal and scale the first layer before applying the second. Bare Electric Stoody Self-Hardening enables the operator to complete the job in one pass*, thus eliminating the extra work of scaling and repositioning. Bare Electric Stoody Self-Hardening possesses the same wear resistance, toughness and hardness as coated rods and bonds readily with manganese.

Have you tried **BARE ELECTRIC STOODY SELF-HARDENING?**

You'll save valuable time by switching from the coated rods on these applications: Roll Crushers, Jaw Crushers, Swing Hammers, Grizzlies, Sand Pump Impellers and Casings, Baffle Plates, Shaker Pans, etc.

A trial order of 200 pounds at 50c per pound, f.o.b., Whittier, California, will prove the outstanding advantages of ¼" Bare Electric Stoody Self-Hardening for any of the above applications. Orders should be accompanied with a priority rating of AA-4 or higher.

STOODY COMPANY

1129 WEST SLAUSON AVENUE, WHITTIER, CALIFORNIA

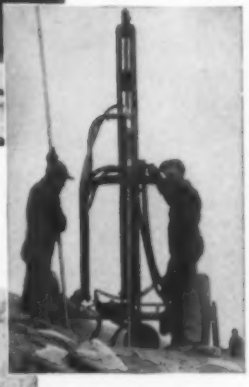
*Using ¼" electrodes

STOODY HARD-FACING ALLOYS

Stop wear . . . Eliminate Repair

HERE'S WHAT WE MEAN by maneuverability IN GARDNER-DENVER UM-99 .. WAGON DRILLS

Accurate Spotting



Down Holes

Toe Holes

Sixty-seven pounds of speed and power—Gardner-Denver S-73 Sinker—for faster drilling in hard rock.

Horizontal Drilling

For complete specifications on Gardner-Denver Wagon Drills and Sinkers, write Gardner-Denver Company, Quincy, Ill.

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Since 1859

• Page Buckets answer today's call for speed on all earth-moving jobs, because, automatically, they dig right in, doing more work per shift. The result is lowered cost of operation—INCREASED PROFITS for you! It's the AUTOMATIC feature of a Page Bucket that causes it to strike first on its forward arch, and rock back on the teeth, ready for the first pull of the load line to start the bite! It's the AUTOMATIC feature that enables it to outdig any other dragline bucket of equal size and weight.

Boost Production ... Keep America Strong

Safety Contest Winners

(Continued from page 52)

Schmidt Bros., Sand & Supply Co., worked 15,009 man-hours.

Warren river plant, Warren, Warren County, Pa., operated by the General Concrete Products Corporation, worked 14,576 man-hours.

Columbus lake plant, Columbus, Platte County, Nebraska, operated by the Gerhold-Matzen Co., worked 14,000 man-hours.

Wausau dry-bank, dry-pit plant, Wausau, Marathon County, Wis., operated by the Carl Lotz Sand and Gravel Co., worked 13,982 man-hours.

Chillicothe dry-bank plant, Chillicothe, Peoria County, Ill., operated by the Coogan Gravel Co., worked 13,308 man-hours.

Titusville dry-bank plant, Titusville, Venango County, Pa., operated by the Earl P. Curry Sand & Gravel Co., 12,947 man-hours.

Lincoln river plant, Lincoln, Kanawha County, W. Va., operated by The Zenith Sand Co., worked 12,374 man-hours.

Ludlow Falls wet-pit plant, Ludlow Falls, Miami County, Ohio, operated by the Steiners Washed Sand & Gravel Co., worked 9,376 man-hours.

West Alexandria river plant, West Alexandria, Preble County, Ohio, operated by the Steiners Washed Sand & Gravel Co., worked 9,184 man-hours.

Fort Gay river plant, Fort Gay, Wayne County, W. Va., operated by the Laval Sand Co., worked 8,593 man-hours.

Missouri river plant, St. Charles, St. Charles County, Missouri, operated by the Norman Trading & Transportation Co., worked 8,550 man-hours.

Proctor wet-pit plant, Proctor, Marshall County, W. Va., operated by the Wells Pit Sand Co., worked 5,663 man-hours.

Record Sand and Gravel Production in 1942

BUREAU OF MINES figures recently released show that approximately five percent more sand and gravel was produced in the United States in 1942 than in 1941, and for the fourth successive year a new record was attained. Total output of sand and gravel was 304,346,000 tons valued at $188,500,000 in 1942, and 288,715,000 tons at $147,207,000 in 1941. Contractors and construction or highway maintenance crews employed by Federal, State, county and municipal governments accounted for approximately 23 percent of the production compared with 37 percent in 1941.

Commercial producers reported sales of 232,947,787 tons valued at $159,427,273 in 1942 compared with 181,556,467 tons at $114,706,913 in 1941, an increase of 28 percent in quantity and 39 percent in value. The average value was 68c a ton in 1942 and 63c a ton in 1941. Building sand increased approximately 15 percent, the production being 46,035,701 tons compared with 40,164,731 tons in 1941. Output of paving sand amounted to 33,307,106 tons in 1942 and 27,013,283 tons in 1941, an increase of 23 percent.

Prepared material (washed, screened, etc.) amounting to 200,131,369 tons accounted for approximately 86 percent of commercial production. The average value was 73c a ton for prepared and 38c a ton for unprepared sand and gravel. Of the total commercial output, 47 percent was shipped by truck, 43 percent by railroad, and 10 percent by water.

Sand-Lime Brick Production and Shipments

FOUR active sand-lime block and brick plants reported for June and five for May, statistics for which were published in July, 1943.

AVERAGE PRICE FOR JUNE

	Plant Price	Delivered Price
Detroit, Mich.	.....	$16.00
Saginaw, Mich.	$13.00	.....
Grand Rapids, Mich.	.....	15.00
Seattle, Wash.	16.50	18.50

STATISTICS FOR MAY AND JUNE

	*May	†June
Production	1,066,000	954,100
Shipments (rail)	195,000	310,000
Shipments (truck)	896,898	796,720
Stocks on Hand	392,780	289,560
Unfilled Orders	1,300,000	875,000

*Five plants reporting: incomplete, one not reporting production and three not reporting unfilled orders.

†Four plants reporting: incomplete, two not reporting unfilled orders.

In Stride with the Times

☆ How to make better wire rope . . . How to keep abreast of new developments in wire rope using equipment . . . How to care for and use wire rope properly so that it will last longer—these are problems that have constantly had our consideration ever since the first Leschen Wire Rope was made.

☆ Because of this background, "HERCULES" (Red-Strand) Wire Rope is daily proving its exceptional ability to cope with present wartime conditions. Its endurance and dependability mean more work hours from every pound of steel used in its making . . . less time lost in making replacements . . . greater overall efficiency.

ROUND STRAND • FLATTENED STRAND • PREFORMED

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WIRE ROPE MAKERS — ESTABLISHED 1857

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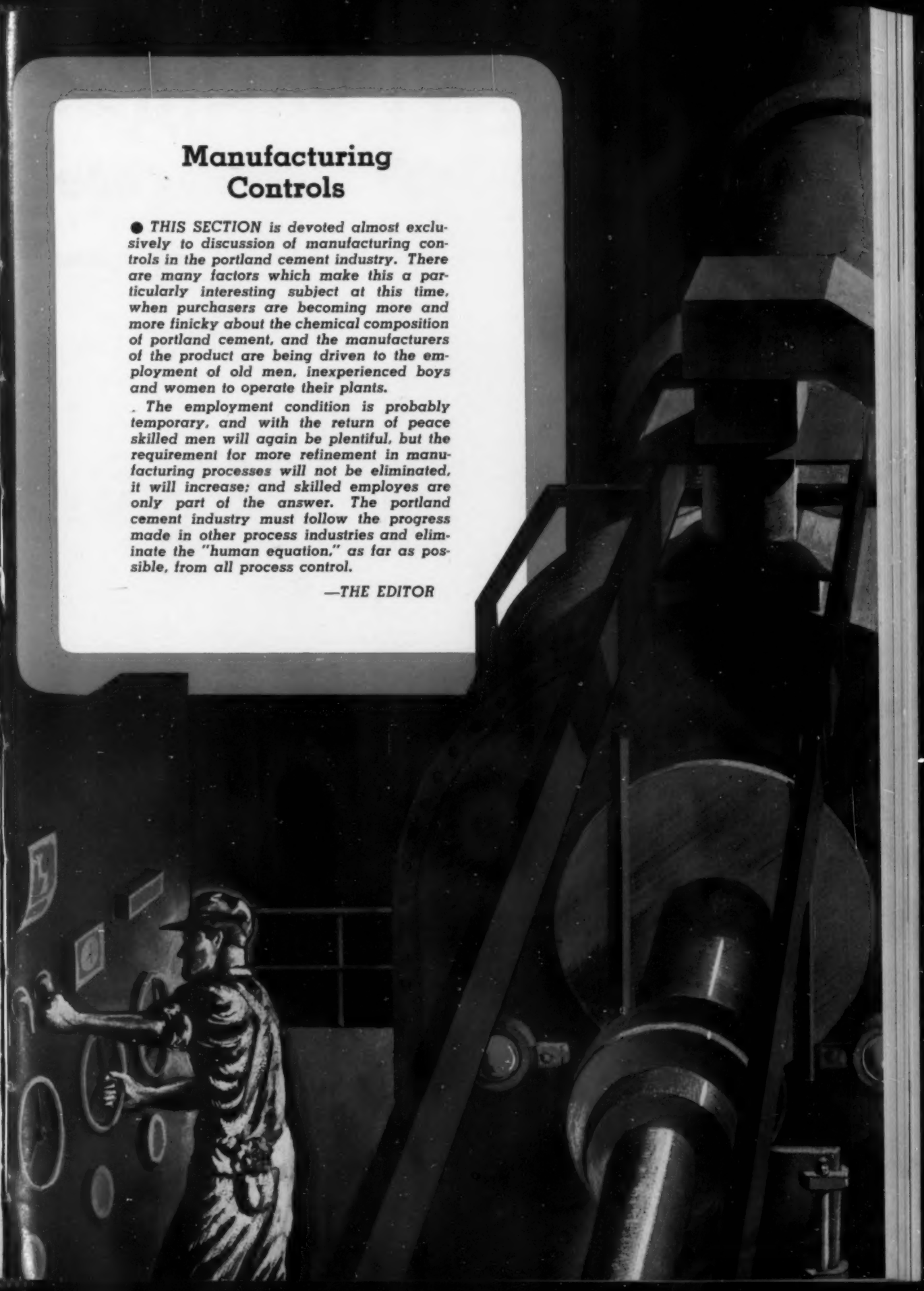
Manufacturing Controls

● *THIS SECTION is devoted almost exclusively to discussion of manufacturing controls in the portland cement industry. There are many factors which make this a particularly interesting subject at this time, when purchasers are becoming more and more finicky about the chemical composition of portland cement, and the manufacturers of the product are being driven to the employment of old men, inexperienced boys and women to operate their plants.*

. The employment condition is probably temporary, and with the return of peace skilled men will again be plentiful, but the requirement for more refinement in manufacturing processes will not be eliminated, it will increase; and skilled employes are only part of the answer. The portland cement industry must follow the progress made in other process industries and eliminate the "human equation," as far as possible, from all process control.

—THE EDITOR



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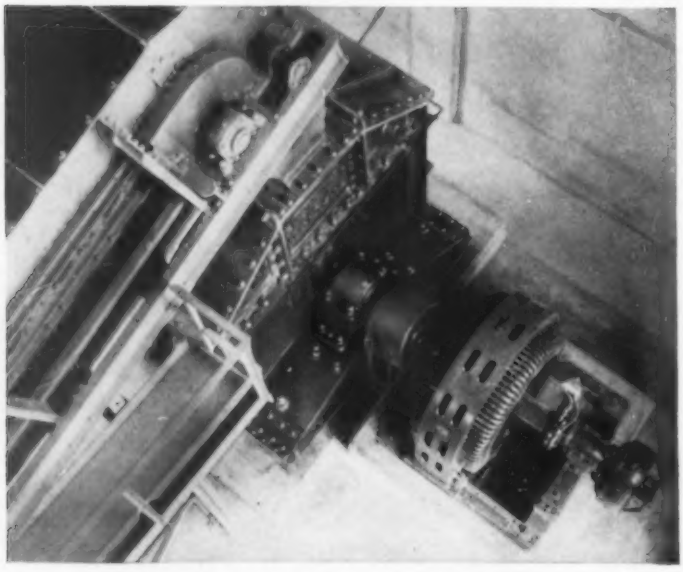

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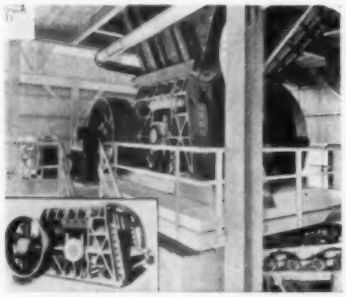

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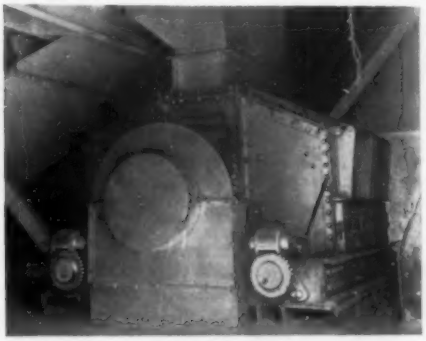

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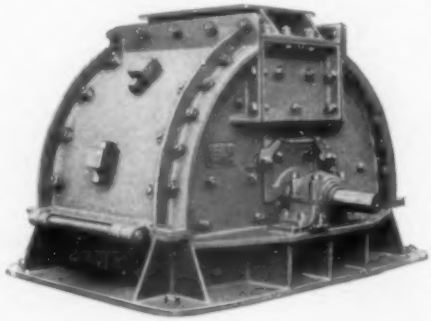

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STEELBUILT CRUSHERS

Centralize Control of Rotary Kilns

New developments in instrumentation largely have removed the uncertainties faced by the kiln burner in former days

By T. OFFRELL*

IN THE CEMENT, lime and many metallurgical industries, the rotary kiln is one of the most important single pieces of equipment. Plant output and product quality depend to a large extent upon the kiln capacity and efficiency at which it is operated. The use of control equipment and combustion control centrally arranged on a control panel at the burners' platform enables the kiln burner to operate the kiln at its best efficiency with resulting improved economy in the utilization of the kiln fuel, improved kiln operation, and more uniform and improved output of the kiln.

*Chief electrical engineer, F. L. Smidth & Co.

Some 15 to 20 years ago, the kilns in the cement plants were mostly operated without the aid of instruments. Sometimes an indicating pyrometer was used for measuring the kiln exit gas temperature but often the kiln was operated without even this instrument. The kilns were mostly short and inefficient with high exit temperatures and correspondingly high losses. Except for the laboratory analysis the operation of the kiln was left almost entirely to the burner's judgment as to the appearance of the clinker and occasionally he watched the chimney for black smoke and adjusted the burning accordingly. Many of the kilns were operated with a fuel rate of from 110 to 135 lb. of coal per barrel of clinker produced.

With the introduction of modern long, economical kilns and auxiliary equipment with corresponding uniformity of operation and product, the fuel rate has been materially reduced. The use of a centralized control system with the necessary instruments and combustion control equipment will assure the best operation and economy. With such modern wet process cement kilns a fuel rate of approximately 75-80 lb. of coal (or equivalent in oil or gas) per

Fig. 1: Kiln equipped with centralized control. 1. Stack. 2. Induced draft fan. 3. Louvre damper. 4. Kiln dust chamber. 5. Kiln feed pipe. 6. Measuring bucket for calibrating kiln feeder. 7. Kiln feeder. 8. Kiln feeder counter and contact device for electrical counter on kiln control panel. 9. Kiln feeder overflow pipe to storage basin. 10. Overflow contact device for actuating signal light on kiln control panel. 11. Special motor driving kiln feeder, synchronized with kiln speed. 12. Kiln feed end draft pipe connected with draft gauge on kiln control panel. 13. Thermocouple with protective pipe for measuring kiln exit gas temperature. 14. Electrical gas analyzer for CO_2 and unburned combustibles. 15. Gas analyzer sampling device. 16. Thermometer with high temperature switch actuating alarm horn and light on kiln control panel for protection of draft fan. 17. Heat transfer chain system. 18. Kiln master gear and pinion. 19. Kiln gear reducer. 20. Kiln motor, adjustable speed. 21. Alternator coupled to kiln motor, generating a.-c. of varying frequency for synchronizing kiln feeder with speed of kiln. 22. Magneto tachometer for kiln speed. 23. Mechanical kiln revolution counter with contact device for electrical counter on kiln control panel. 24. Embedded kiln shell pyrometer thermocouple for measuring temperature of kiln gases before the chain system. 25. Collector rings for kiln shell thermocouples. 26. Pyrometer wire along kiln shell connecting thermocouple with collecting rings. 27. Collector assembly for one or several thermocouples. 28. Pyrometer wire to recorder on kiln control panel. 29. Embedded kiln shell pyrometer thermocouple in sintering zone on metallurgical and sintering kilns. 30. Draft pipe, connecting to draft gauge or draft controller. 31. Coal blower and motor. 32. Kiln fuel pipe. 33. Centralized kiln panel on burner's platform. 34. Independent concrete support for control panel. 35. Conduit lines for control cables. 36. Clinker discharge. 37. Clinker conveyor. 38. Coal mill. 39. Coal mill feeder motor. 40. Hot air duct. 41. Coal bin. 42. Magneto tachometer for coal feeder speed indicator 43. Coal mill load pick-up indicates or automatically controls load of mill. 44. Connections for coal mill differential pressure gauge. 45. Thermometer with high temperature switch and alarm for coal-air mixture temperature. 46. Thermometer for hot air to coal mill. 47. Hot air tempering damper. 48. Coal mill motor

CENTRALIZED KILN CONTROL
GENERAL VIEW OF ROTARY KILN WITH INTEGRAL COOLER, SYNCHRONIZED FEEDER, INDUCED DRAFT FAN, LOUVRE DAMPER AND COAL MILL.

barrel is obtained. Under present conditions, fuel economy is more important than ever and instruments serve an important part in obtaining this.

Fig. 1 shows diagramatically a F. L. Smidth & Co. modern wet process rotary kiln for cement. The various parts and auxiliary equipment are numbered and identified in the nomenclature.

The kiln shown is equipped with an integral cooler which also serves as the preheater for the secondary combustion air. The length of such a kiln usually is between 350 to 450 ft. or longer for a very large capacity kiln. The kilns are also equipped with special chain system in the drying zone which serves as an efficient heat transfer medium between the kiln gases and the raw material being fed to the kiln. The exit gas temperature will usually vary between 450 to 650 degrees F. depending upon the size of the kiln and capacity at which it is operated.

The kiln is direct-fired with pulverized coal which is dried and ground in a unit pulverizer of the tube-mill type, the "Tirax" mill.

The kiln is preferably driven by means of a d.-c. adjustable speed motor with a 3:1 or 4:1 speed adjustment through a gear reducer, master pinion and gear on the kiln.

The maximum speed of the kiln is usually from 1 to 1.2 r.p.m. The kiln motor should have stable speed characteristics and must not change its speed appreciably with the load.

To insure uniform loading and flow of material through the kiln, the kiln feed is synchronized automatically with the speed of the kiln. This is accomplished by means of a special F. L. Smidth & Co. patented synchronized feeder drive consisting of a small alternator coupled to the kiln motor or drive and a special a.-c. motor for driving the kiln feeder. The alternator generates a.-c. current of a frequency corresponding to the speed of the kiln. This a.-c. power drives the feeder motor which will then run at a speed corresponding to the frequency and, therefore, in direct proportion to the kiln speed. This will insure a uniform and proportional loading of the kiln at all speeds. For testing purposes and for emergency operation the feeder motor can be connected to the local power supply by means of a transfer switch and in this way be operated at constant speed and independent of the kiln and alternator.

Thermocouples Connected to Pyrometer Indicator Record Kiln Temperature

Comparatively recently F. L. Smidth & Co. has developed and installed special thermocouple assemblies on the kiln. These thermocouple assemblies project through the kiln shell and lining, and measure the temperature inside the kiln. The thermocouples are connected to special collector rings with collectors. The collectors are in turn connected to the pyrometer indicator and recorder on the kiln control panel. For cement kilns usually only one thermocouple is used, this being located after the chain system but a second thermocouple located 50 to 100 ft. away from the first thermocouple has proven useful during starting up of the kiln.

For sintering kilns or metallurgical kilns, several thermocouples may be used. One or two of these are located in the sintering zone.

The relative temperature readings obtained from the embedded couples have proven very useful in the operation of the kiln as the burner can judge how the material flows through the kiln and can take proper steps to overcome the formation of rings, surges, and over- or under-burned material. This in particular applies to the sintering kilns where it is of utmost importance to closely control the temperature of the material in the sintering zone.

Check Temperatures with Radiation or Electric Eye Pyrometers

Radiation or electric eye type pyrometers may be installed as a final check on the temperature of the material as it leaves the hot zone. It is, however, often found difficult to control the kiln based on this temperature alone due to the time lag of half an hour or more between the time the material enters the hot zone and leaves same. It is also often difficult to have a clear unobstructed view of sight partly due to pulsations of the flame and partly to dust which result in an irregular temperature record. In many instances it is necessary to have a permanent record of this temperature and the expense for this type of pyrometer equipment may well be justified. In all cases it is advisable to take regular temperature readings in the burning zone with a portable optical pyrometer and keep a record of such temperature readings.

In connection with their rotary kilns, F. L. Smidth & Co. has pioneered in the use of instruments

Fig. 2: Centralized control panel for cement kiln. The 4-point temperature recorder and gas analyzer recorder are mounted inside the cubicle and are observed through the window in front of the panel. Instruments mounted on the panel include: Recording air weight controller for clinker cooler; potentiometer type temperature indicator; CO_2 indicator; $CO+H_2$ indicator; speed indicators for kiln, slurry feeder, coal mill feeder; 2-point draft gauge for kiln discharge and feed end; 3-point draft gauge for coal mill; louvre damper position indicator; ammeters for induced draft fan, coal mill fans, kiln, coal mill and mill feeder; magnetic revolution counters for kiln and slurry feeder; control for checking rate of feed to kiln; indicating temperature gauges for air for coal mill; rheostats for adjusting speed of kiln, coal mill feeder and cooler fan; manual damper regulators with position indicators; electric clock; alarm system for high temperatures; interlock switches and relays; control switches for starting and stopping of motors; telephone for communication with kiln feed end

and control equipment mounted on a centralized control panel located at the burners' platform. This enables the burner to read all the instruments and control the kiln from a central point, thereby assuring the proper operation of the kiln and various kiln accessories at all times. Centralized control panels of this type have been designed and furnished by F. L. Smidth & Co. during the last 18 years as part of their kiln equipment.

Centralized Control Panels

In designing such control panels it is necessary to study each kiln installation and determine what instruments and control equipment are required in order to make a compact and simple control system. Often it is necessary to design and manufacture special control equipment such as embedded kiln shell pyrometer equipment, damper regulators, synchronized feeder equipment, level and feed indicators, etc. All of this equipment must be coordinated with the necessary motor controls, etc. Complete wiring diagrams of panel, as well as general wiring diagrams and electrical layouts for the kiln department are a part of this work in order to facilitate and simplify the field work.

The motors for the kiln and fuel supply, as well as conveying equipment after the kiln, can be started from the control panel. Interlock switches with alarm systems and indicating lamps on the control panel indicate to the burner the stopping of remotely located motors.

The temperature instruments are often furnished with high temperature contacts connected to a siren to warn the operator of excessive temperatures. Kiln and feeder speeds are adjusted and various dampers are operated either directly by means of wire rope regulators or by electric control from the kiln panel. The important motors have indicating ammeters and the adjustable speed motors are equipped with magneto tachometers for actuating speed indicators or recording the speed on the same chart as the temperatures. Automatic airflow controllers or fuel flow controllers are provided when required.

In general, a completely automatic control system is not used. So many different factors affect the kiln operation that often a completely automatic control system becomes rather complicated and expensive, and requires considerable maintenance. Instead, a system of indicating and recording instruments is provided serving as a guide to the burner in operating the kiln. The burner makes the adjustments accordingly, taking due consideration to irregularities in the kiln that can only be judged by an experienced burner. By observing the records of the instruments, the burner can anticipate irregularities and take the necessary corrective steps at an early stage, and keep the kiln operating uniformly.

Fig. 3: Gas analyzer recorder, kiln speed recorder and two temperature recorders are mounted inside the cubicle. In front of panel are mounted: Ammeters; speed indicators; damper position indicator; draft and flow gauges; CO_2 indicator; $CO+H_2$ indicator; temperature indicator; revolution counters; electric clock; rheostats for speed adjustment of d-c motors, temperature alarm system; start-stop control switches; telephone for communication with kiln feed end

In order to insure complete combustion with a minimum fuel consumption, it is important that the kiln exit gases are analyzed either with the aid of an automatic continuous indicating and recording gas analyzer, or at suitable intervals with an Orsat apparatus.

Continuous Sampling of Kiln Gases Is Necessary

The F. L. Smidth & Co. gas analyzer provides means for continuously sampling of the kiln gases and analyses for carbon dioxide (CO_2) and combustibles ($CO+H_2$). The analyzer is installed at the kiln feed end and consists of two analyzer units with the necessary filters, cooler, copper oxide rectifier and aspirator enclosed in a thermostatically controlled steel cabinet. The gas sample is drawn continuously from the mouth of the kiln through a special sampling device.

The analyzer units operate on the Wheatstone bridge principle. One analyzer unit measures CO_2 content based on heat conductivity, and the other analyzer unit measures the unburned combustibles by measuring the heat developed when these gases are burned with sufficient air added. The two indicators which are mounted on the kiln control panel, are calibrated directly in CO_2 and $CO+H_2$. The analyses are also recorded on a two-point recorder which is mounted inside the kiln control panel and the kiln operator can,

(Continued on page 81)

Possibilities of

Automatic Kiln Control*

Comprehensive study of process characteristics

By JOHN R. GREEN†

EVERY SYSTEM of process control has definite characteristics which can be cataloged and analyzed to select the quantities (factors) to be controlled, as well as the type of controls required. These process characteristics can be described as:

(1) *Demand-side capacity* — the mass of product in the kiln.

(2) *Supply-side capacity*—the heat capacity (available) in the refractory lining, the product of combustion, the preheated air from clinker cooler.

(3) *Transfer log*—the time delays both in delivery from supply side to demand side; in transfer of heat from flame and refractory to product.

(4) *Transportation lags*—the time delays in both delivery and supply sides such as in fuel transfer from control location to burning zone, and in delivery of product to measuring point, such as product travel through the kiln.

(5) *Measurement lag*—the delay or differential in the detection of the true condition being measured.

(6) *Signal transfer lag*—both the lag between the sensitive element and the controller, and between controller and control mechanism.

(7) *Controller lag*—the time delay in the controller itself, sometimes purposely introduced to average out fluctuations or harmonics in the control system.

(8) *Control mechanism lag*—the time delay in response to control signals.

Conditions Favorable to Control

The various process conditions and lags which are favorable to automatic control may be tabulated as follows:

(1) A maximum demand-side storage capacity.

(2) A minimum load change.

(3) A minimum transfer lag.

(4) A balance between demand and supply capacity, or input ratio, which maintains a minimum potential between demand- and supply-sides.

(5) A minimum transportation lag.

(6) A minimum measuring lag.

(7) A minimum signal transfer lag.

(8) A minimum controller lag.

(9) A minimum control mechanism lag.

Desirable Objectives of Control

Control from final product, or downstream control. Stabilization by independent control of all possible variable factors affecting the final control system.

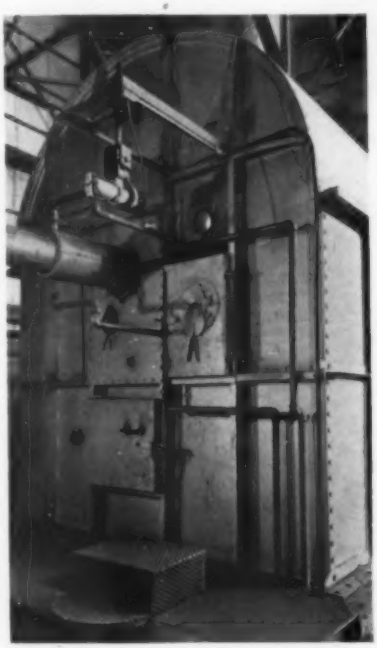

Fig. 1: Radiation pyrometer mounted proper distance away from sighting hole

Interlocking controls by automatically establishing from a final control, the measured conditions at intermediate points in the process, where favorable control characteristics exist.

Provision for minimum supply changes per unit of demand change.

Counteraction against any change as rapidly as possible—arrest the trend.

Avoidance of control by means of through-put-changes wherever other control means are available, which will not limit production below the capacity of the process equipment.

On-Off, Maximum-Minimum, or Two Position Control is the simplest type of control and recognizes only direction of change from the desired condition. Obviously this does not provide the requirement for minimum supply change per unit change in demand, and is applicable only to favorable process characteristics or for minimum control requirements. The limits on magnitude of supply change must be set in excess of the minimum and maximum demand requirements. "Hunting" or cycling around the control point is a fundamental characteristic of this type of control.

Floating Control is a modification of the two position type in that it recognizes direction of deviation from the desired condition and also duration of that deviation. It does not recognize rate or direction of change when away from the control point nor magnitude of change. The change in supply is usually slow, either by design of the control mechanism or by an interruption or lagging in the control signal. The rate of supply change may be increased beyond one or more deviation limits in order to partially recognize the magnitude of deviation. The introduction of a "dead neutral" or inactive zone at the desired condition will decrease the rate of supply change to zero at that point, but will widen the total

* Based on two recent technical papers by the author: (1) "Instrumentation and Control of Rotary Kilns," American Institute of Mining and Metallurgical Engineers (February, 1941), and (2) "Automatic Control of Cement Kilns," Committee on Manufacturing Research, Portland Cement Association (November, 1942).

† Manager of Steel and Ceramic Division, Brown Instrument Co., Philadelphia, Pa.

deviations or control band. This type of control is fundamentally "hunting" in its nature, and applicable only to processes having a minimum of lag, or delay in total response, if slow wide deviations are to be avoided.

Proportioning or Throttling Control provides a supply change in proportion to the deviation of the quantity under control in respect to a control band which now replaces the definite and fixed desired quantity. In control practice this method should not be confused with floating control, as defined above, nor with the combustion terminology where the term is applied to the proportioning of fuel to air. In this type of control there is a definite and fixed supply provided for each condition of the quantity with respect to its control band or width, but irrespective of the relation of that quantity to the exact desired condition.

It can be seen, therefore, that *Proportioning or Throttling Control* recognizes "direction," "magnitude," and to a certain extent "rate" of deviation from a fixed condition, but does not recognize the exact desired condition. Controls of this type are fundamentally stabilizing in their nature and eliminate "hunting" by their ability to recognize deviation from stability, although not necessarily establishing the exact desired condition. This type of control also provides the means of securing the necessary small units of supply change per unit change in demand, required for unfavorable process, characteristics or lags. This unit of supply change per unit of demand, commonly referred to as "throttling range" and expressed in percentage of demand scale range which is required for full supply change, may be large (zero throttling range) or so small that a demand change of several times the total range of the controlling instrument may be required to position the control mechanism through its full travel. In *Proportioning Control* the greater the supply change per unit of demand change (or narrower the throttling range) which can be employed without hunting, the nearer the desired quantity can be maintained under load changes. Conversely, the smaller the supply unit required for the process the greater the deviation from control condition with load changes.

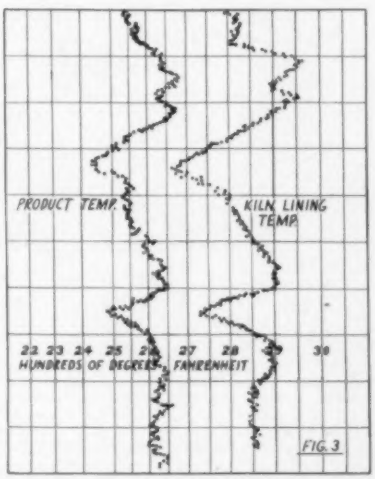

Fig. 3: Record taken simultaneously of both kiln wall and product

Proportioning or Throttling Control with Automatic Reset (automatic load compensation, automatic droop correction) is the control *type* which combines the characteristics of *Proportioning Control* with the ability to recognize deviation, and its direction, from the exact desired condition in amount, duration, or both. This provides a system of control having both stability and the ability to handle adverse process characteristics, with a latitude of supply adjustment capable of holding the exact desired quantity condition under load changes to the full limits of the available supply.

Rate Response, or the ability to recognize only rate of change in the desired quantity is available in combination with certain types and forms of control. This feature provides additional changes in supply proportionate only to the rate of change in the desired quantity and is valuable by its ability to arrest trends in processes having large lags.

In order to secure the most favorable and stable characteristics of a control system, the supply change per unit of demand change should be an *equal percentage change, not equal unit change*. In other words, as the quantity of supply increases the unit quantity of supply per demand change must increase proportionately if equivalent results are to be produced. This requirement is met by the characterization of valves, dampers, and louvres, or in control mechanism linkage and design.

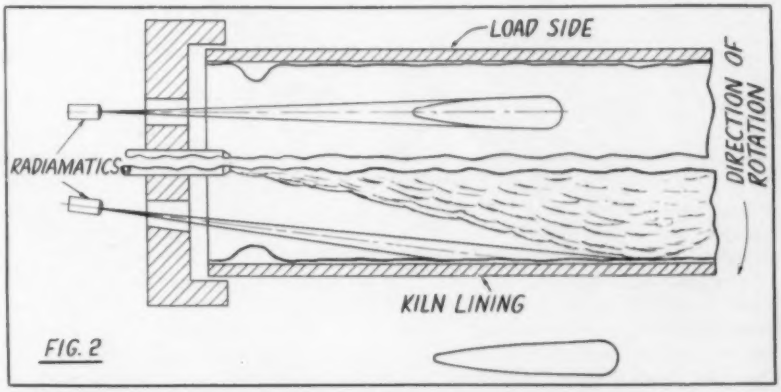

Fig. 2: Illustrating areas of side wall in kiln and product in the field of vision of approximately three geometric degrees

The ideal in *Characteristics* is a Control System which recognizes and properly corrects for any change from the desired condition in respect to: Direction, magnitude, rate and duration.

Control Medium

On the basis of actuating medium, control systems may be divided according to the following classifications:

(1) Electric control.
(2) Pneumatic or air-operated control.
(3) Hydraulic or liquid operated control.

Electric Control Systems involve no control signal transfer lag. The rate of response of the control mechanism is determined by the mechanism speed which is usually constant and fixed regardless of the magnitude of demand. Frequently an intermittent operation either in the controller or control mechanism is required. By means of electrical or mechanical devices all *types* of controls can be supplied with electric operation. Upon interruption of actuating medium the control mechanism normally remains in its last position. When intermediate relays are required between the controller and mechanisms, additional lag may be introduced. When explosive, contam-

inating or dirty atmospheres are encountered, suitable protection must be provided.

Air Operated Controls usually incorporate pilot valves or relays which provide immediate response in the control mechanism and therefore minimize control signal transfer lag. Control is normally continuous rather than intermittent in nature. Power requirements can be handled by the size of diaphragm or piston area in the control mechanism, and positive positioning is assured by position relay devices.

All *types* of control are available in air operated equipment and the throttling and automatic reset or rate response type are inherently handled with greater simplicity than by electric control. Upon interruption in the control medim, air control systems are normally designed to move to the "safe" position. Proper cleaning and preparation of the air supply, occasionally making use of standby or storage units, assure a continuous and trouble-free supply with a minimum of attention. Explosive atmospheres present no hazard, and contaminating or dirty atmospheres are not troublesome due to the self-purging nature of air control. By the use of "non-bleed" pilot valve construction air is consumed only during valve movement and, therefore, requires only a minimum air consumption.

Hydraulically Operated Controls are quite similar to air-operated equipment in their characteristics, but normally involve more extensive supply and return systems and have not been built into indicating or recording controllers.

Control Objectives

In order to apply controls, it is necessary to first select definite objectives and the relative importance of objectives, since usually there is more than one involved.

In rotary kiln control, these objectives might be listed in the order of their importance as follows:

(1) Uniform high quality of product.
(2) Maximum production.
(3) Fuel efficiency.
(4) Low equipment maintenance cost.

It is obvious that the ultimate in each objective detracts from attaining other desirable conditions, therefore, management must select the relative importance, based upon the product and economic requirements. The ultimate in fuel efficiency may very well detract from uniform high quality of the final product.

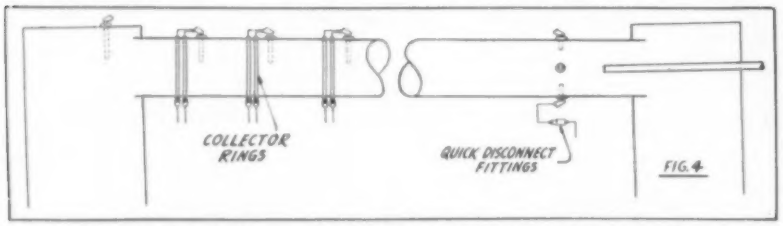

Fig. 4: Method of measuring distribution of heat throughout the kiln

Temperature

Radiation pyrometers (when properly designed and protected) have proven well suited and adequate for measuring kiln temperatures, particularly where records or automatic control are desired. Optical pyrometers serve well as portable indicating devices. Light sensitive devices, or photoelectric cells are also applicable to this service, and are capable of producing records as well as certain forms of automatic control.

Fig. 1 shows a radiation pyrometer mounted far enough away from the sighting hole through the kiln hood to be protected from any puffs or stingouts. and having a sighting tube consisting of a series of settling chambers to prevent dust from reaching the lens.

The characteristics of high temperature measuring devices which are particularly desirable for rotary kiln work might be listed as follows:

(1) The dust condition inside of the kiln itself usually fluctuates considerably, and these fluctuations have their effects upon the readings, but are not cumulative and show up as a continuous fluctuation in the temperature indicated, providing the radiation unit and recorder are responsive to such slight and rapid temperature fluctuations.
(2) Since the surrounding temperature to which the measuring unit

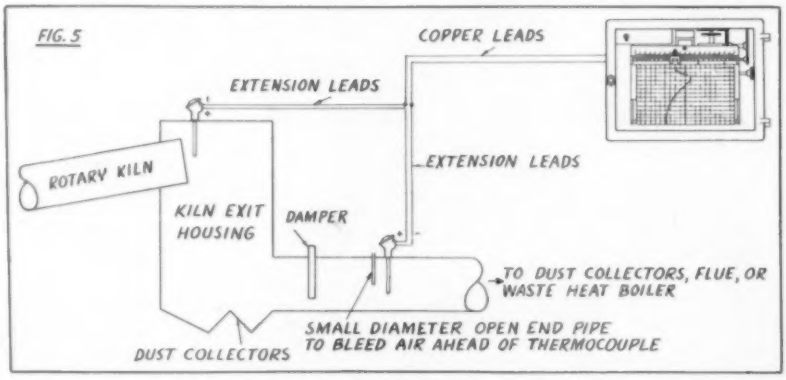

Fig. 5: Method of making exit kiln housing and flues into the mechanics of a total combustible meter

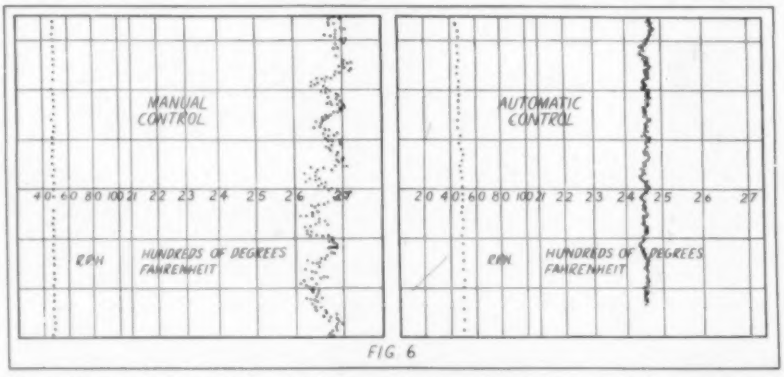

Fig: 6: Representative records of kiln temperatures and speeds under both manual and automatic control of kiln wall temperature

is subjected fluctuates from possibly 0 to over 200 deg. F., these changes should have no effect upon the final reading or upon the life of the measuring unit.

(3) In order to secure the measurement of temperature as far into the high fire zone as possible, a very narrow sighting angle is desirable as shown on Fig. 2, illustrating areas of side wall and product in the field of vision of approximately 3 geometric degrees.

(4) In order to be sure that the proper field is being viewed, it is desirable to have some sighting means on the measuring unit through which the field can be observed.

As has previously been mentioned, temperatures can be taken of both kiln wall and product. Fig. 3 shows a record taken simultaneously of both wall and product.

Factors Influencing Temperature

The following table gives an outline of the factors which affect kiln temperature measurements, as well as comments on the possibility of accurate measurement and control.

Of greater number and varied influence are those factors which influence when, where, and how the heat is delivered to the kiln, the type of flame and rate of flame propagation. Table 2 outlines some of these factors with comments on the possibility of their measurement and control.

TABLE 1—FACTORS INFLUENCING THE PRODUCTION OF HEAT AS APPLIED TO ROTARY KILNS

FACTOR	CAPABLE OF MEASUREMENT	AUTOMATIC CONTROL APPLICABLE
Volume of fuel—Solids	With certain mechanical equipment	Yes in most cases
Liquids	Practically always	
Heating value of fuel	Usually by Periodic tests	Rarely
Volume of air	Yes, if suitable constructions are available	Yes—if measurable
Temperature of air	Yes, within limits and depending upon construction conditions	Yes—if measurable

TABLE 2—FACTORS INFLUENCING THE DISTRIBUTION OF HEAT PRODUCED IN FIRING ROTARY KILNS

FACTOR	CAPABLE OF MEASUREMENT	AUTOMATIC CONTROL APPLICABLE
Kiln and burner design		
Kiln pressure	Yes—Firing hood	Yes—prime importance
Volume primary air	Yes	Yes
Temperature primary air	Yes	Yes
Fuel temp. and press. liquids	Yes	Yes
Fuel fineness solids	Possible	Possible
Volume secondary air	Yes, within the limits of construction	Yes, within measurable limits
Temperature secondary air	Within limits	Within measurable limits and mechanical possibilities

Several means are available of measuring the distribution of heat throughout the kiln are shown in Fig. 4.

It has also been suggested that a series of shoe type thermocouples of heavy construction riding on the kiln shell might be used as a relative measure of the extent of the high fire zone.

The measurement of exhaust gas temperature in the feed end housing falls into this general classification and is probably the oldest measurement, in point of service, used on rotary kilns.

(Continued on page 68)

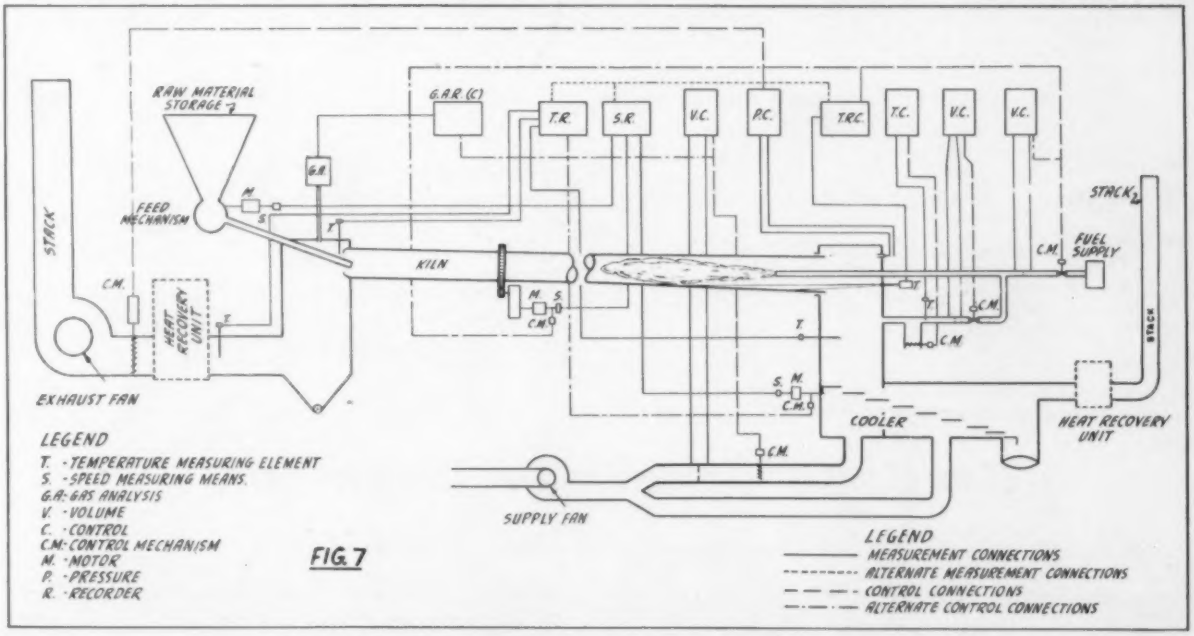

FIG. 7

Fig. 7: Schematic layout showing many of the commonly controlled factors in a rotary kiln

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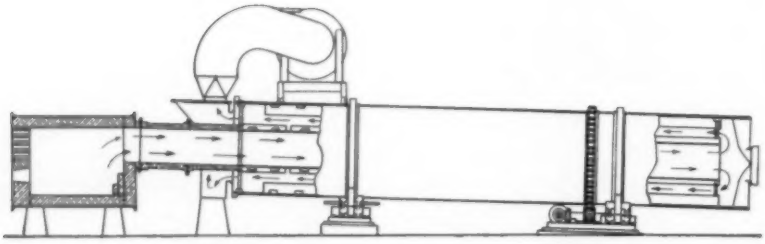
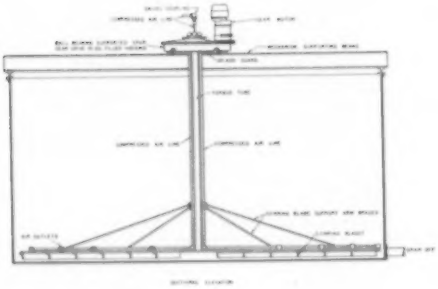


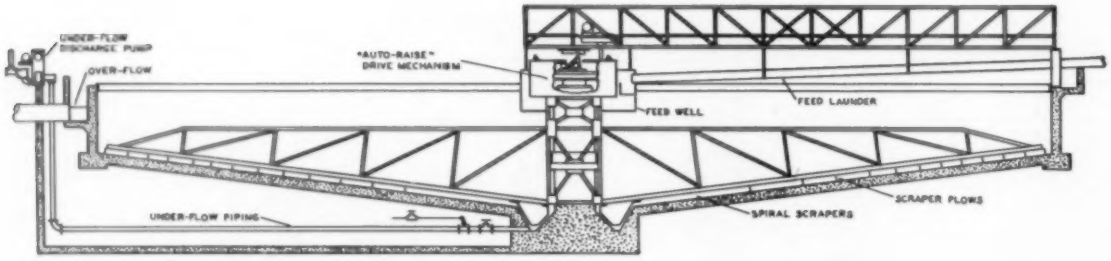
"Ruggles-Coles" Rotary Dryers, Kilns and Coolers

The class "XA" Double Shell Rotary Dryer, for the drying of coal, reduces the operating and maintenance expense of your coal grinding equipment. The class "XF" Single Dryer is preferred for the drying of the limestone. Bulletin 16-C.



Hardinge Slurry Mixers

A complete line of Slurry mixers using a mechanical mixer combined with air agitation. The mechanism is mounted on Ball Bearings and operates in an oil type housing. Bulletin 31-C.



Hardinge "Auto-Raise" Thickeners

Large center column Thickeners equipped with "Auto-Raise" driving mechanism that lifts the entire scraping mechanism above any obstruction in the tank. The Thickener operates through any overload. Bulletin 31-C.

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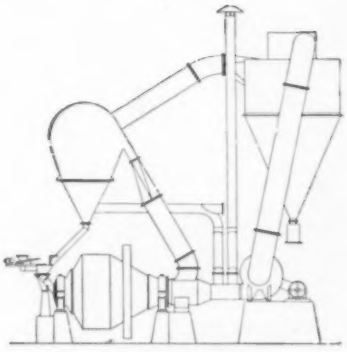
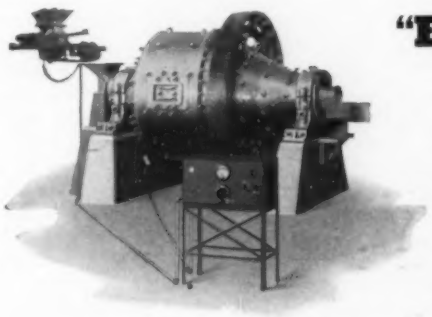


Hardinge Conical Ball Mills

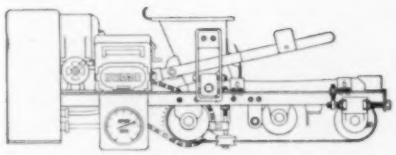
Conical Ball Mills are furnished with air classifier or screens for Dry grinding, screens and counter-current classifier for Wet grinding. The Theromill is used for dry grinding material containing up to 10% initial moisture without the use of a separate dryer. Bulletin 13-D.



"Electric Ear" Sound Control Unit

The installation of the "Electric Ear" to control the feed to the Ball Mill has resulted in a 10% to 15% increase in capacity with a more uniform product. The cost of the unit is negligible and the unit can be installed without stopping the mill. Bulletin 42.

Constant Weight Feeders



The constant weight Feeder or Feedometer measures by weight rather than volume, thereby eliminating variations due to specific gravity or size of the material. The Feedometer indicates the rate of feed and totalizes the weight fed. Installation of the feeder has resulted in 10% increase in Mill capacity with no increase in power. Bulletin 33-C.

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Fig. 9: Bleed damper for temperature control of primary air

Kiln and feeder speeds are easily measured by means of electric generator tachometers geared to drive motors and indicated, recorded, or automatically controlled on the firing floor. Revolutions or production rates are totalized on electrical or mechanical counters.

Kiln feed, whether by volume or weight, is usually synchronized with kiln speed by mechanical or electrical interlocking, but lacking these means may be automatically controlled in any ratio desired by means of differential tachometer instruments.

Combustion Efficiency

Regulation of fuel to air ratio is desirable to hold either maximum combustion efficiency or the desired atmospheric conditions inside the kiln.

Continuous gas analysis equipment suitable for recording or automatically controlling these conditions have been, however, beset with a multitude of ills. The fact that large quantities of dust are usually present in the exhaust gases makes the securing of a continuous clean sample, without excessive maintenance, a problem.

For the cement and lime industries, the analysis for "Total Combustibles" or "Oxygen," or both, depending upon the desired gas composition, seems to be the logical answer.

All continuous gas analysis equipment should be electrical in principle, so that time lag is reduced to the minimum, or at least electrical in transmission, since the recorder or controller should always be on the firing floor, a considerable distance from the analysis equipment.

One other method of measuring combustion efficiency has proved practicable where the exit gases are high enough in temperature to support combustion. It consists essentially of making the exit kiln housing and flues into the mechanics of a total combustible meter as shown in Fig. 5. In addition to the usual kiln exit temperature element, another element is installed in the duct system or kiln housing following the admission of air, preferably for this purpose and in reasonably constant volume.

If unburned combustibles are present, secondary combustion takes place and a higher temperature is shown by the second element. The simplest and most effective way of showing this condition is to connect both elements differentially on a recording meter located on the firing floor, thus eliminating the necessity for reading differences between two recorded temperatures. The trailing element will normally be at a lower temperature due to radiation losses, but when secondary combustion takes place, its temperature approaches or exceeds the first element. Bearing in mind that the heat losses caused by the presence of ½ percent CO in the flue gas are approximately equal to those found with 20 percent excess air, any air deficiency is a serious blow to fuel efficiency as well as such secondary factors as boiler tube conditions, caused by secondary combustion at those locations.

Automatic Control

Considered in its fundamentals there are two basic methods of automatic control. Both involve temperature measurements but by contrasting methods. The first method consists of maintaining a constant firing rate which will not burn the linings, and automatically varying the kiln speed, charging rate, or both in unison, from the product temperature as it leaves the high fire zone.

Advantages claimed for this method of operation are as follows:

(1) Maintains steady firing rate with stability in all of the related factors of air volume, air temperature, furnace pressure, etc.

(2) Maximum possible firing rate that refractories will stand.

(3) Maximum kiln speed, or production rate, that will produce properly fired product under these conditions.

One notable disadvantage of this system, which is based upon changes in kiln speed, is its distortion of the time-temperature relationship on the product, and the fact that a large quantity of material in the kiln is affected at one point or another in its heating period, with a corresponding long-time lag in stabilizing the final results.

The second method consists of the automatic control of fuel supply from kiln-wall temperature. The primary object of this method is to run the kiln wall in the high temperature

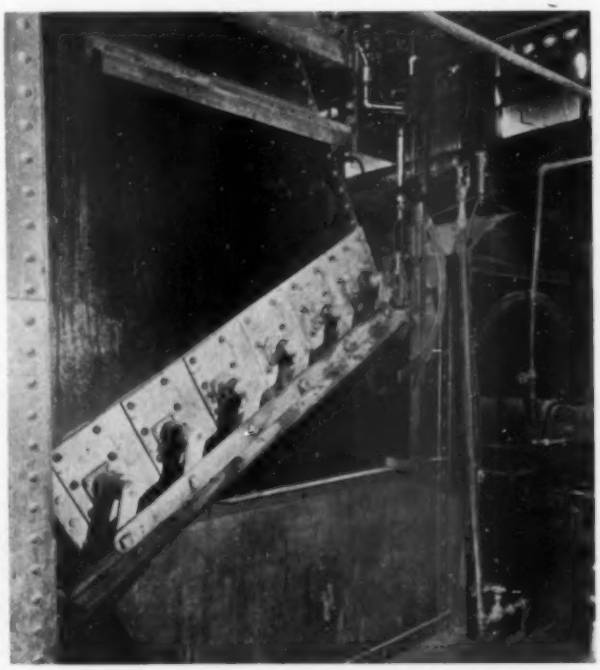

Fig. 8: Typical installation of a power piston operated from a pressure controller and moving an exhaust louvre damper

zone near the maximum safe temperature which will not damage the lining, the kiln speed (and feed) being held constant at the maximum speed and charging rate to deliver the desired product.

This method of operation has the following advantages claimed for it:

(1) Comparatively rapid response to changes, i.e., small process lag.

(2) Does not vary the desired time-temperature schedule.

(3) Follows the basically sound principle in the automatic control of continuous processes of not varying the thruput or production rate if variation of any other factor will produce the desired results.

(4) Responds, to some extent, to changes in the temperature of product itself, as caused by minor fluctuations in mass being discharged, and tends to offset these changes before the product leaves the kiln.

A possible disadvantage of this system is the lack of a direct temperature measurement of the product itself. This can, however, be substituted for the measurement of kiln lining temperature, with the corresponding loss of control over the maximum allowable temperature of the kiln lining.

It is, of course, entirely possible to combine both of these basic methods of control, i.e., fuel supply or kiln speed, since they supplement each other, although the stabilization of a major condition by either method usually permits easy manual regulation of the other factor. Representative records of kiln temperatures and speeds under both manual and automatic control of kiln wall temperature are shown in Fig. 6.

The mechanics of temperature control by fuel feed vary with the fuel and mechanical equipment installed.

Automatic Control of Secondary Factors

Supplementing any basic control plan, a number of the contributing factors to combustion may be controlled, depending upon the mechanical equipment and processing devices used in connection with the kiln proper. Fig. 7 is a schematic layout, showing many of these commonly controlled factors.

Kiln pressure control should be of the differential type, i.e., compensated for atmospheric pressure changes near the pressure tap, and preferably taking its measurment at the firing hood rather than at the feed end housing in order to compensate for varying kiln resistance, such as is caused by ring formations of the product.

A typical installation of a power piston operated from a pressure controller and moving an exhaust louvre damper is shown in Fig. 8.

The control of primary air volume is readily accomplished with the proper piping layout, and is also a reasonably accurate control of powdered coal feed in unit air-swept mills equipped with constant level devices.

Temperature control of primary air, where preheated air passing over cooling products is available, is also easily secured by bleed dampers such as illustrated in Fig. 9. Where a control of primary air volume is not used the installation of face and by-pass dampers rather than a bleed damper helps to maintain reasonably uniform volume.

The control of secondary (or total) air volume is a controversial subject. Within certain limits, however, it is capable of stabilizing conditions as is shown in Fig. 10, illustrating charts of the air flow in delivery ducts with and without automatic control.

Combinations of Controls

In considering the control of all of these secondary factors which influence the basic control of kiln temperature or kiln speed, it should be born in mind that it is entirely possible with modern equipment to interlock the control instruments so that variations in any one measured factor — temperature, speed, flow, pressure or gas analysis, will automatically change the control point for any other variable or group of related variables, and in practically any ratio desired, thus keeping them in the proper balance for the desired results.

Although each measurement has been considered individually, it is entirely practical to combine a number of records in one instrument, even including the automatic control of one or more conditions.

Visits England

Eric A. Johnston, chairman of the Washington Brick and Lime Co. and president of the United States Chamber of Commerce, has been invited by the British Government and the British National Committee of the International Chamber of Commerce, to visit England to study British industrial and economic systems under wartime pressures. He will also give attention to the joint war effort and to cooperation between British and American commercial interests in the post-war period.

Making Shower Bases of Concrete

Olympic Stone Co., Seattle, Wash., has been making a large number of concrete shower bases. A plaster mold is used in making these bases. The mold, according to *Northwest Plastering Industries*, is boxed in to form the side bearing for the cast, and two methods are used in manufacturing the base. One involves tamping the concrete, and the other is a poured cast product.

Coal Strike Shuts Down Cement Plant

Superior Portland Cement Co., Concrete, Wash., recently resumed operations after a short shut-down due to the lack of coal occasioned by the coal strike. Continued operation is dependent upon whether the coal miners remain on the job.

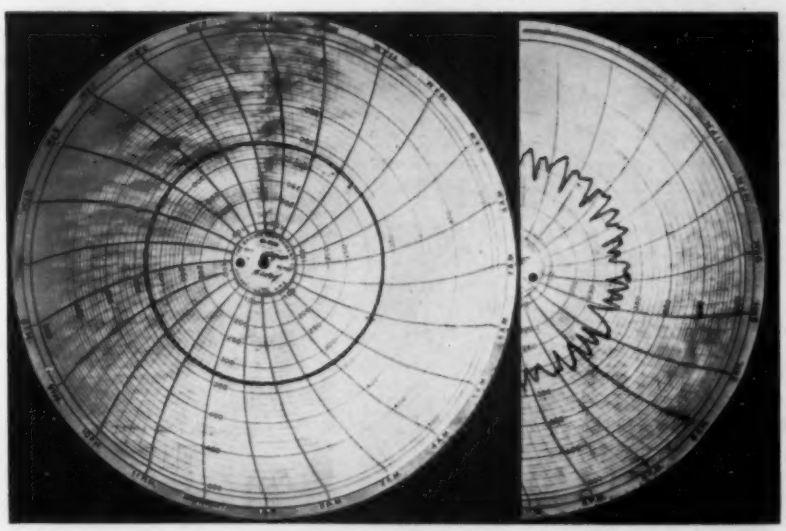

Fig. 10: Charts illustrating air flow in delivery ducts with and without automatic control

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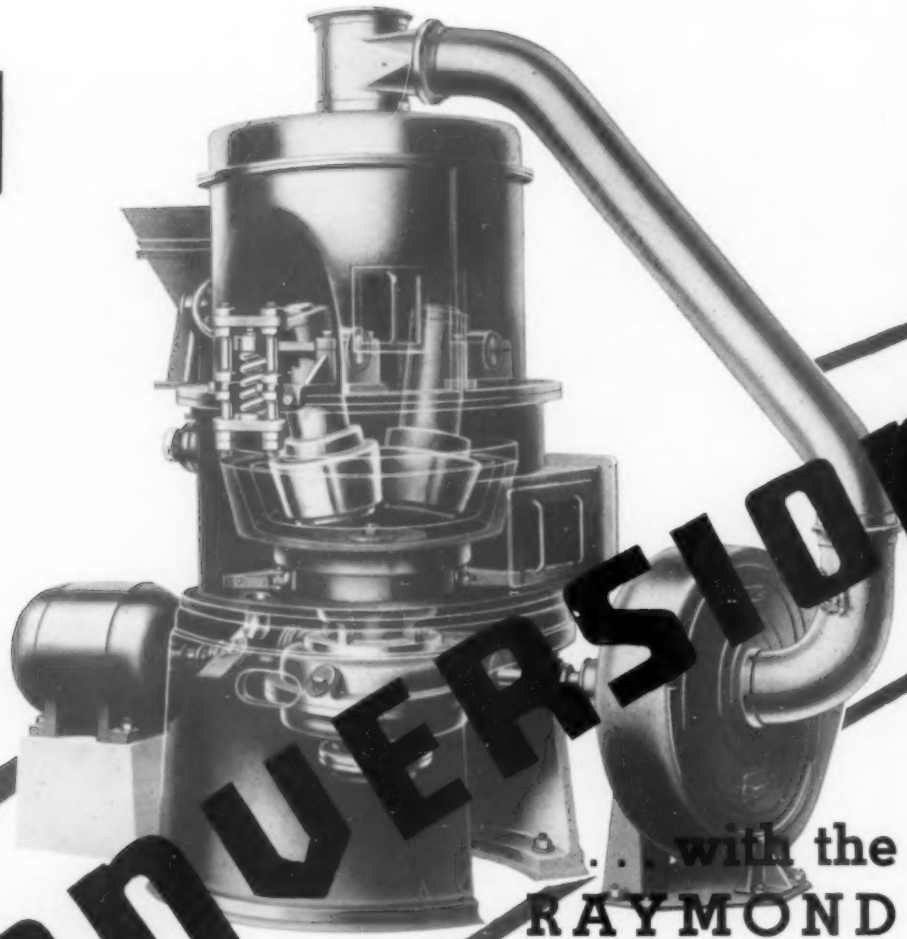

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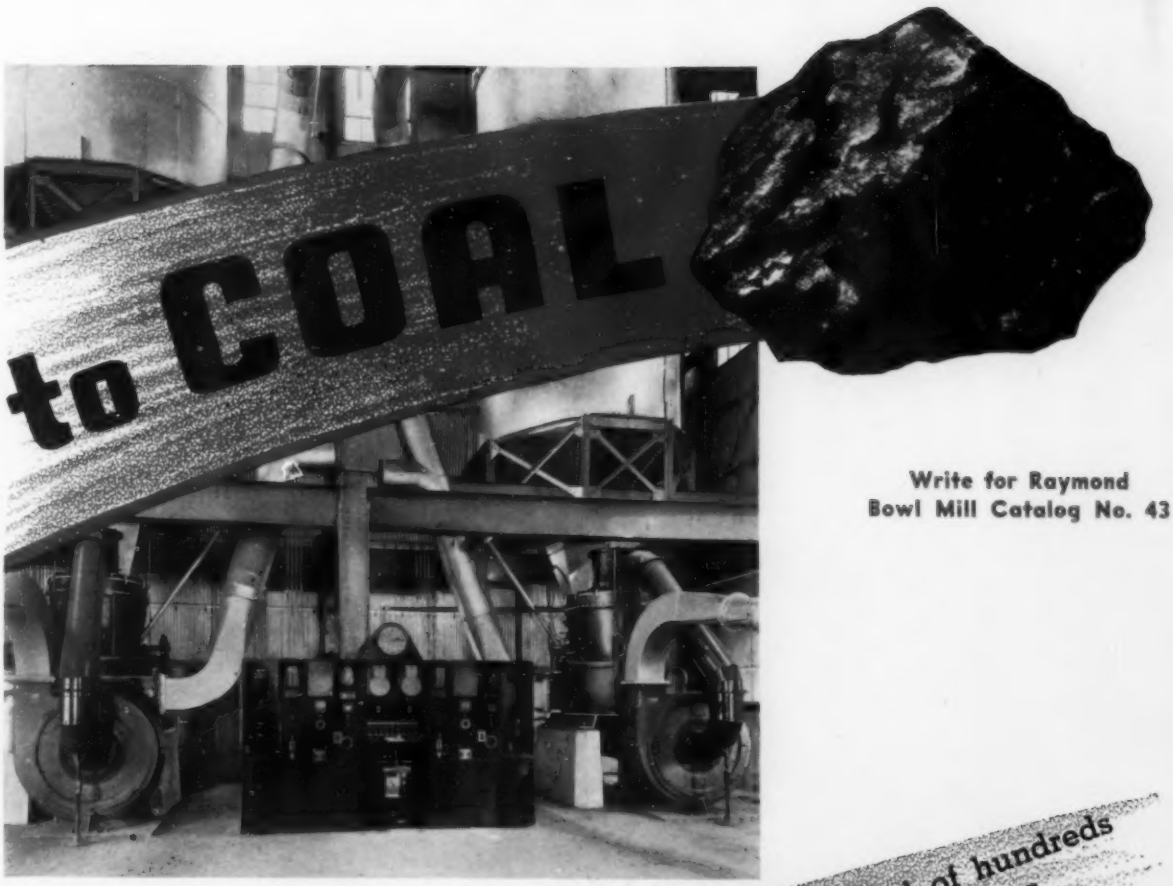

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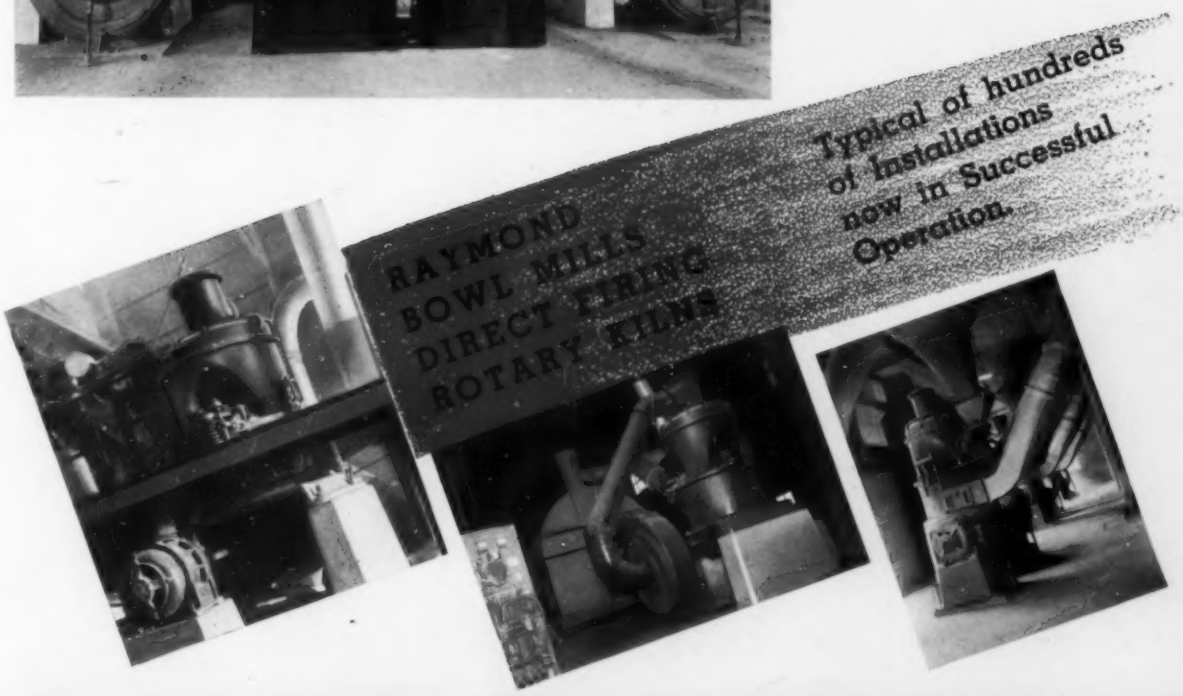

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AUTOMATIC Temperature Control of Rotary Kilns

By A. A. BLACKMAN*

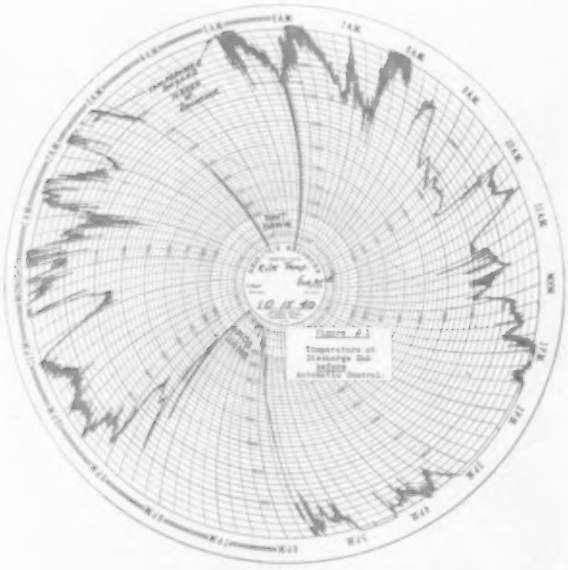


Fig. 1: Chart record of temperature discharge end before installation of automatic control

IT IS THE PURPOSE of this paper to describe the operation of automatic temperature control as applied to a large rotary lime kiln. The kiln under discussion can be considered typical of those used extensively for calcining, drying, and roasting and reduction operations. The kiln is approximately 160 ft. long and 8 ft. in diameter. Fired with natural gas, the average heat requirement is in the order of 1,500,000,000 B.t.u. per day.

The wet feed rate through the kiln is from 500 tons to 700 tons per day. The feed is only reasonably uniform inasmuch as it is subject to irregularities met at earlier steps in the process flow schedule. The clinker discharge is 100 to 200 tons daily.

Firing is done at the discharge end of the kiln by means of a single burner. Gas is supplied to the burner at 60 lb. pressure. Air to burner is furnished at 12-in. water pressure through a 10-in. line.

In contemplating automatic temperature-control installations on such kilns, the first reaction on the part of the users is that uniform temperature control is not possible, due to the slow travel of feed with its inherent long time lag, and irregularity of load. This irregularity in load is further increased due to variation in moisture content or chemical compositions. It will be the direct object of this paper to show that it is possible to attain such uniformity of temperature in spite of an unfavorable time lag and a bad load factor.

(Continued on page 76)

*Instrument Engineer, The Bristol Co.

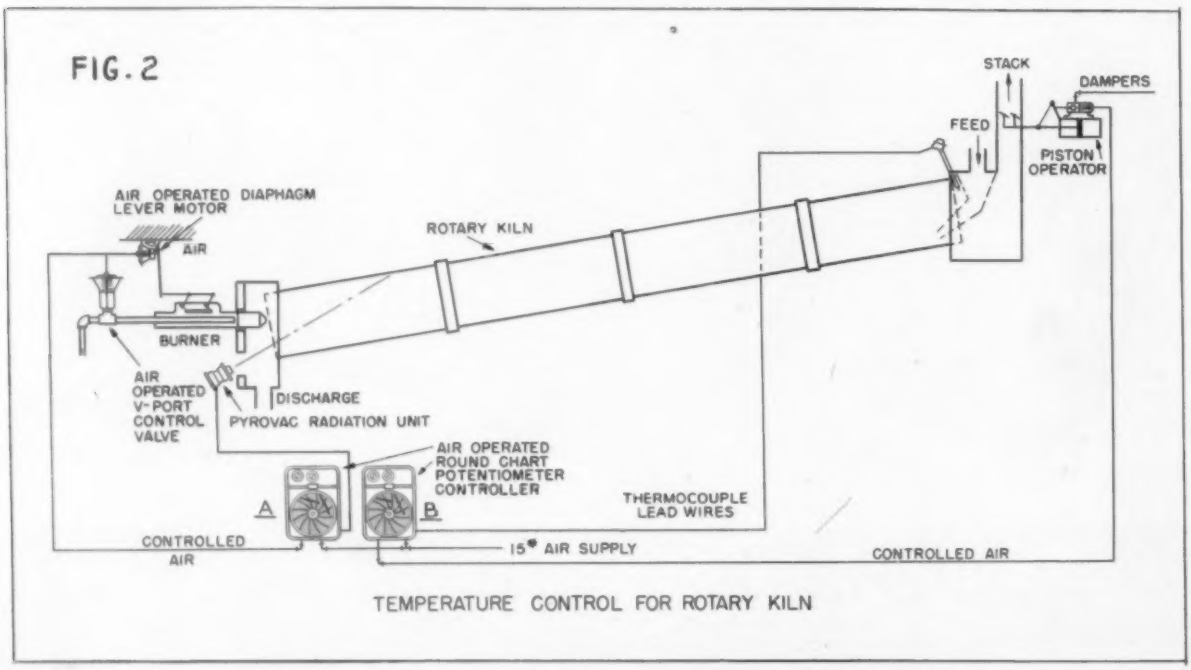
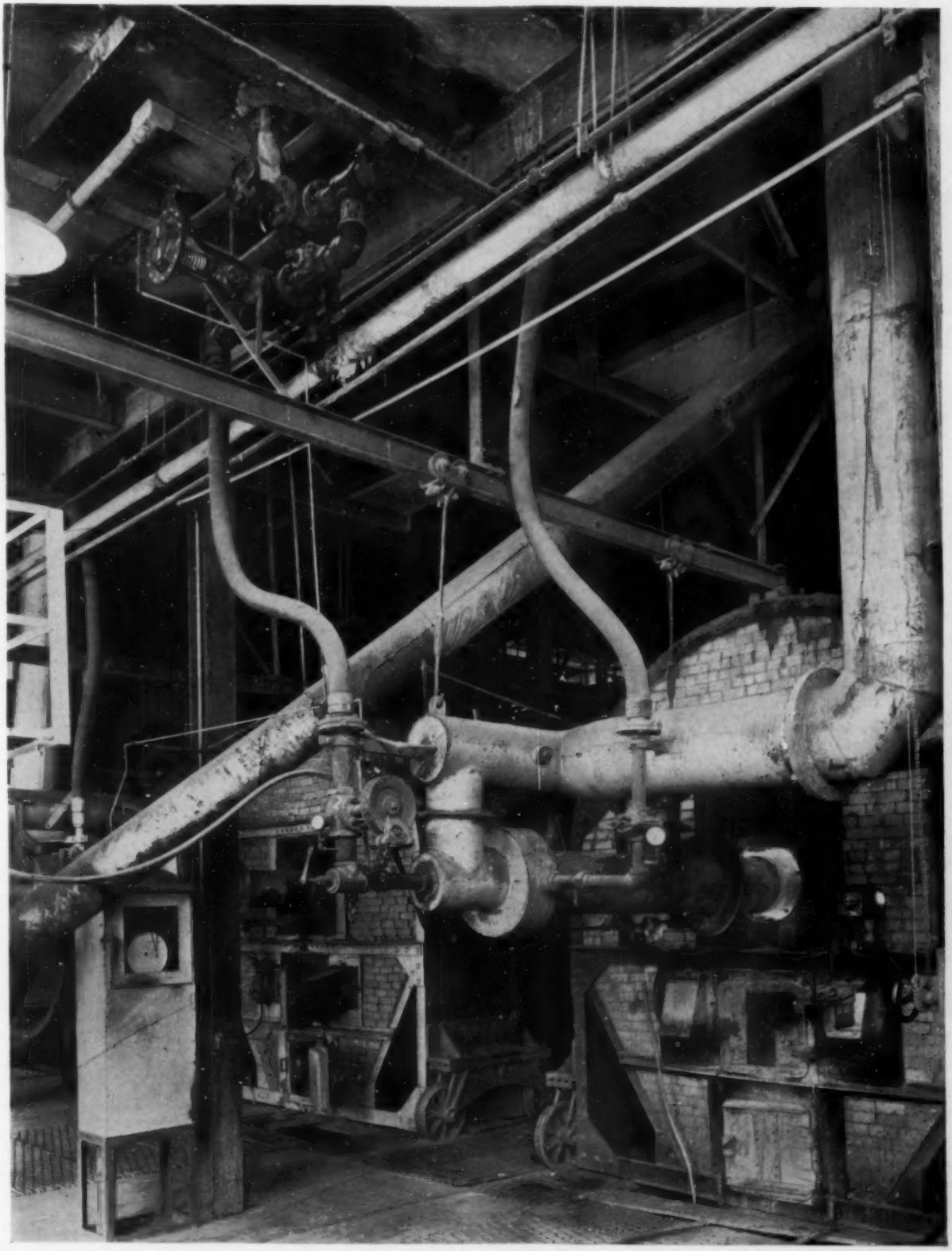


Fig. 2: Schematic diagram of rotary kiln equipped with automatic controls



General view of discharge end of rotary end kiln showing the relative location of various control equipment

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Buell's use of large diameter cyclones produces two important results:

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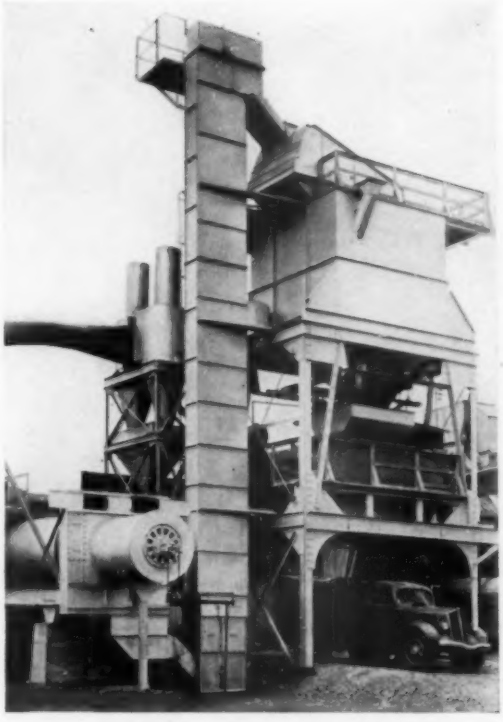
Buell (van Tongeren) Dust Recovery Systems, handling gas volumes from 500 c. f. m. upwards, are now in successful operation with Kilns, Dryers, Raw Mills, Finishing Mills, Clinker Coolers, Waste Heat Boilers and Asphalt Plants.



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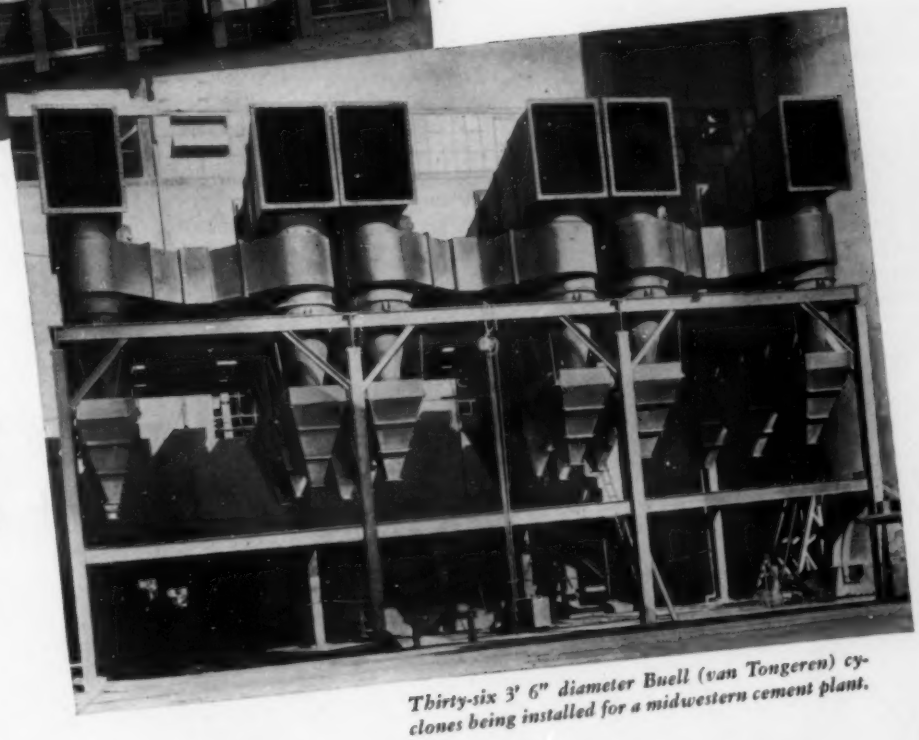

Thirty-six 3' 6" diameter Buell (van Tongeren) cyclones being installed for a midwestern cement plant.

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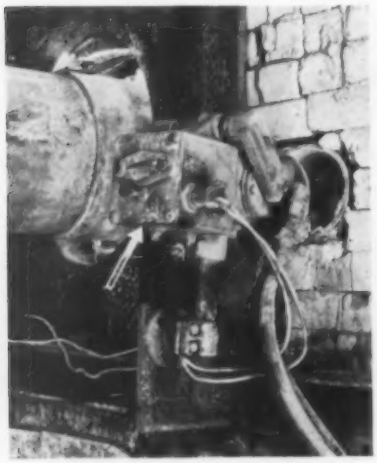

Fig. 5: Radiation unit on discharge end of kiln

Fig. 6: Radiation type round chart recorder controller on discharge end of rotary kiln

Fig. 7: Diaphragm type air-operated valve controlling gas to burner on rotary kiln

The need for automatic temperature control is graphically shown in Fig. 1. The chart reproduced represents the temperature variation when under normal manual supervision. Temperatures shown are those of the clinker at discharge end of the kiln as recorded by radiation pyrometer unit. This chart, Fig. 1, is submitted as typical of the operation before automatic control was provided. In fact the temperature variation *before* automatic control was added is even worse than indicated by Fig. 1, since much of the time the temperature was beyond the range of the recorder.

The automatic control as a layout consists of two distinct units; one at the discharge end (fuel firing end), and the other at the feed end.

Fuel Control Unit

The unit (see instrument "A" in Fig. 2) at the fuel firing end of the kiln consists of a radiation pyrometer with a lens system for focusing the radiant energy upon a highly sensitive thermopile. The radiation pyrometer is focused on the clinker through the front of the kiln at a point some 10 or 12 ft. back into the kiln. (See Fig. 5.) After focusing, the unit is rigidly clamped in position. The millivolt output from the radiation unit is measured and recorded continuously on a self-balancing potentiometer recorder shown in Fig. 6.

In focusing, due care must be taken to see that burner flame does not cut across the range of the radiation pyrometer. Embodied within the recorder, is an air-operated control unit. In view of the time lag and load changes inherent in the system, this control mechanism has built into it a throttling range adjustment (to adjust control sensitivity to process lag). In order to maintain "point control" in the face of load change, the controller mechanism also had "automatic reset" features.

(Continued on page 78)

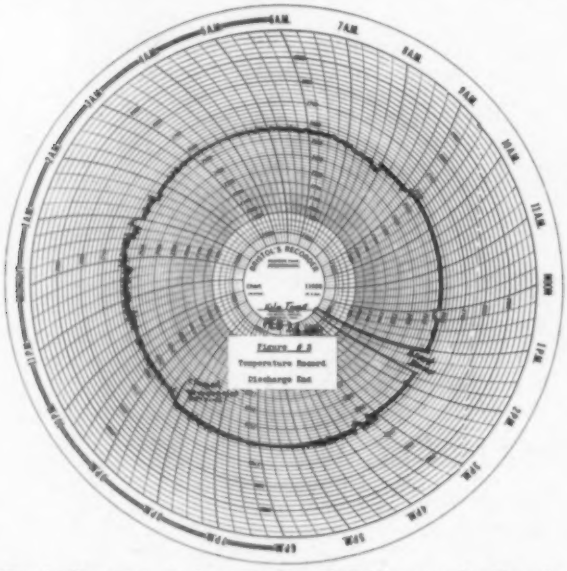

Fig. 3: Chart record of temperature of discharge end with automatic control

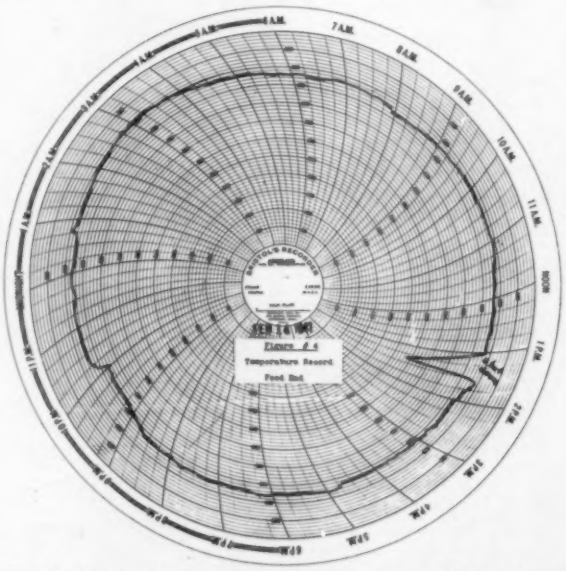

Fig. 4: Chart record of feed end temperature with automatic control

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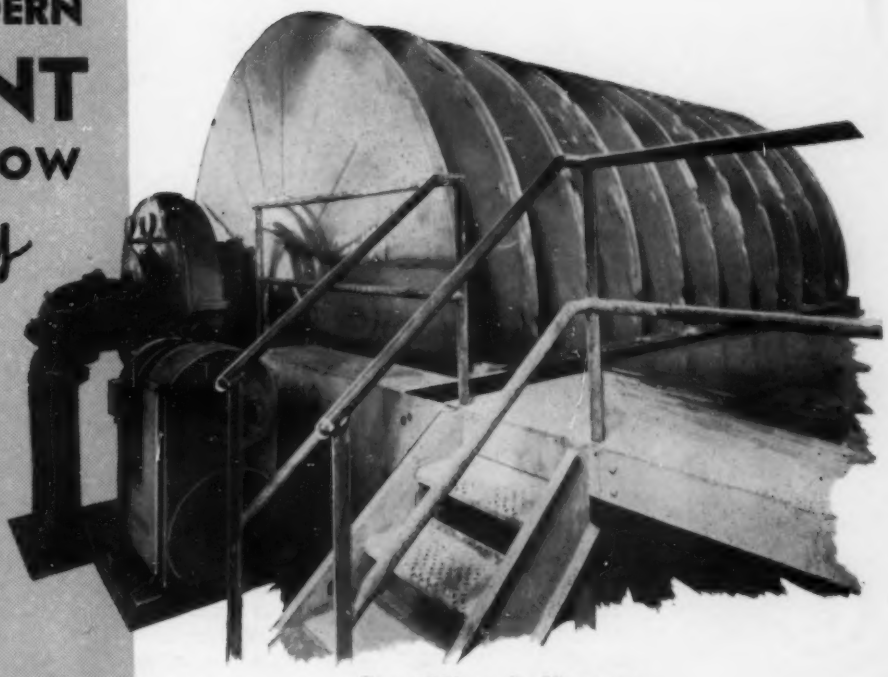

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Fig. 9: Thermocouple type pyrometer controller on feed end of rotary kiln

A 2½-in. double seated air-operated V-port valve was placed in the gas line (see Fig. 7). The opening of this valve is throttled by controlled air from the pilot mechanism within the recorder-controller. A 3-in. hand-operated gate valve by-passes a portion of the maximum gas requirement (estimated at 25 to 30 percent of maximum). Naturally, in setting the by-pass valve, care and judgment was exercised to see that flow through the by-pass did not exceed minimum requirement at any feed rate. An air-operated lever was connected by suitable linkage to operate two small dampers furnishing the air to the gas burner (see Fig. 8).

The linkages on the dampers were adjusted to maintain proper ratio of air to gas. A chart marked Fig. 3 is reproduced showing the temperature control obtained. In appraising this record, it is to be borne in mind that the temperature responsive element is highly sensitive and instantaneous in its ability to pick up temperature changes. The record therefore, is in no way "softened" as might be the case if a thermocouple were being used with a heavy protection well to average out temperature peaks. Furthermore, it should also be remembered that the hot clinker-like material is continually tumbling over in front of the radiation pyrometer as the kiln rotates.

When the above two facts are considered, we believe that it can be said that very good temperature regulation is being obtained. Certainly, the mass of material as discharged from the kiln must be very close to that optimum temperature selected, as shown by the chart record.

Feed End Temperature Control

The feed end temperature control (see instrument in Fig. 2) works independently of the discharge end temperature control. This unit consists of recorder-controller of the potentiometer type, similar to the one used for the fuel end control, with the exception that a thermocouple is used as a primary temperature measuring device rather than a radiation type unit. (See Fig. 9.) The thermocouple, 30 in. long, is placed in the exhaust gases leaving the kiln. The control mechanism positions two 4- x 5-ft. dampers operating in tandem. Actual movement of dampers is accomplished by means of a double acting piston, operating with oil or compressed air. (See Fig. 10.) The piston is 2½-in. diameter, with a 24-in. stroke. Air pressure of 60 lbs. is applied to piston. The piston, of course, is provided with a positioning

(Continued on page 120)

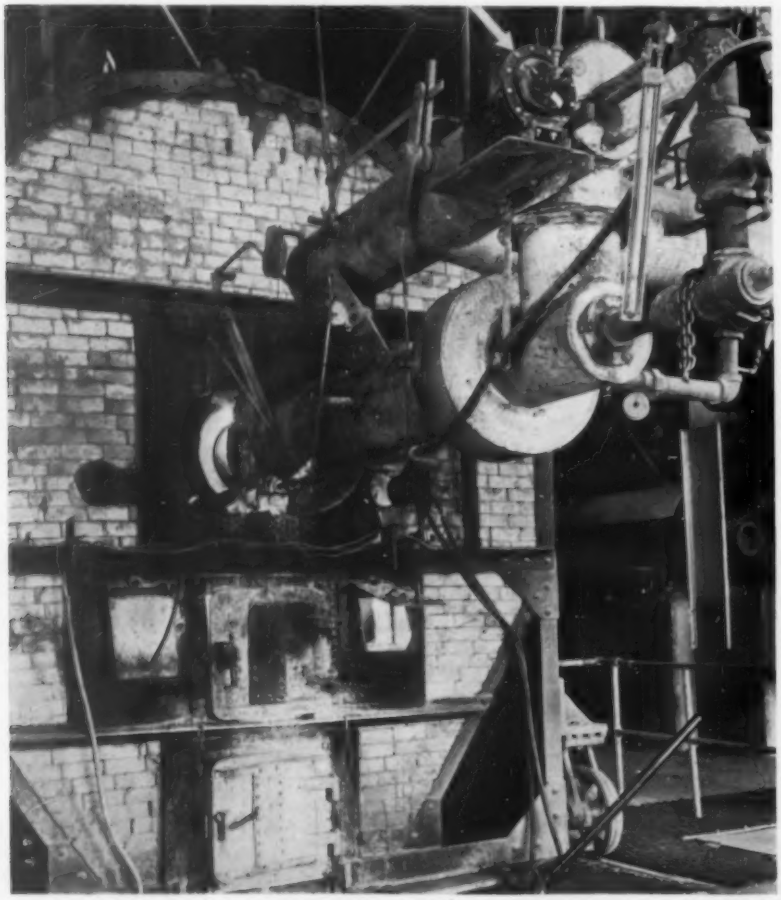

Fig. 8: Diaphragm type air-operated lever motor controlling dampers on air supply to burner of rotary kiln. Arrow points to installation

Fig. 10: Piston type damper operator on stack of rotary kiln

ROTARY KILNS

ROTARY KILNS

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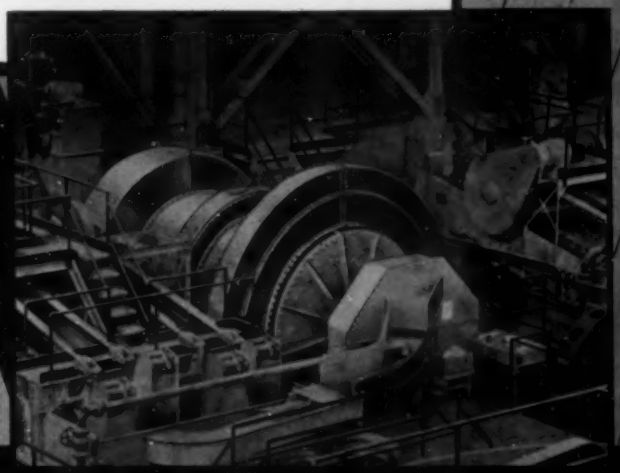
GRINDING MILLS



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Adapting Control System to New Products

Automatic instrument controls facilitate change-over of cement plant rotary kiln for production of other products

By H. G. MEAD*

Chas. Taylor Sons Co.

Optical pyrometer of potentiometer type

IN THE PRESENT SITUATION in which rotary cement kilns are being used for ore sintering; stationary kilns for heat-treatment; and mixers, conveyors and other mineral-hauling equipment is likewise working at unusual tasks, there is need for adaptability in the industry's control instruments. For example:

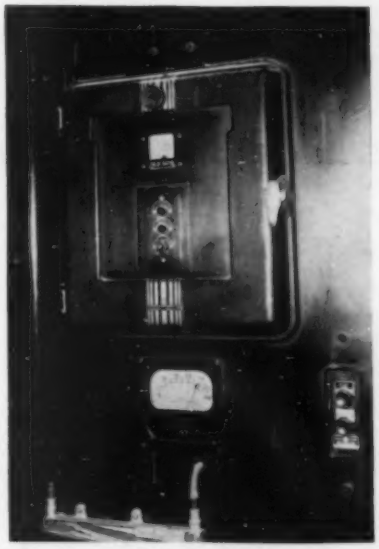
A cement plant with several small kilns and two large ones was given the job of sintering iron ore. The plant's new customer, a steel company, sent a metallurgist to the plant. He and the plant manager discussed the differences between sintering of ore and cement materials; kiln temperatures, pressures, atmospheres, feeds, speeds, quenching etc., were considered, and a production routine roughed out. A kiln operator was selected on the basis of alertness, carefulness, ability to follow instructions, and unwillingness to take chances.

The kiln selected for this ore work has automatic control of combustion and of furnace pressure; a Rayotube radiation pyrometer recording the temperature of its sintering zone; and another, a multiple-thermocouple pyrometer, recording its finish, quench and waste-heat-boiler temperatures. With these instruments to help him, the operator has been able to shift from cement-burning to ore-sintering with quite remarkable success. He has time both to watch the inside of the kiln and to watch the size and texture of the sintered ore. If either starts to give trouble he simply changes an instrument setting to correct the draft,

*Field engineer, Leeds & Northrup Co

Rayotube focused on sintering zone in rotary cement kiln at Federal Portland Cement Co. plant

Two burners check kiln temperature at Federal Cement Co. plant by consulting Micromax recorders



Balance-type pressure controller for rotary kiln at Federal Portland Cement Co. plant

feed, temperature or whatever other condition his judgment tells him is causing the disturbance; then he goes back to his blue glass and watches the effect of the change as it develops. Working in this way, he secures exactly the results desired.

Select Instruments Adapted to Automatic Control

The temperature instruments for today's conditions should be selected so that they are easily adapted to automatic control when other conditions favor this step. For instance, one recorder with a Rayotube as sintering-zone detector is being used to control the setting of a Reeves variable-speed drive to the coal feed of a rotary kiln. Another pyrometer of non-recording type uses a thermocouple as a temperature detector and controls the speed of a Kennedy coal-pulverizing mill. In both cases, the electrical control circuits are of a highly advanced type which brings extreme speed and accuracy to the work of holding fuel feed in strict proportion to temperature's changes. These basic pyrometers and electric valve-drives are suitable to practically any temperature-control problem in the industry. The present widespread use of instruments on kilns of all modern types is due to this adaptability.

An important step in industrial control instruments was taken a few years ago when an optical pyrometer which is a true potentiometer was introduced. The previous standard optical instrument had been a milliammeter, whose readings required translating into temperature if they were to be used in connection with other pyrometers. In spite of that, the instrument was probably the most widely-used pyrometer in the mineral industries. The new design, however, reads direct in degrees F (or C), is considerably lighter; is more accurate and in general meets the basic requirement of adaptability, including the fact that it is much easier for a beginner to use.

I should like to add a word about care of instruments. Time and again we go into a cement plant and see all machinery clean and well cared-for — except the instruments. Gear drives will be cleaned and have their oil checked—but if you open the case of an instrument you'll find cement dust on every surface that will hold it. Motors don't get overloaded, but the "bells" inside a pressure controller may be carrying their own weight in dust—and balancing the total on a knife-edge, at that. Admittedly, good instruments can take a terrific beating in service—they wouldn't be so widely used if they couldn't—but they should be put on a regular maintenance schedule.

Centralize Control

(Continued from page 61)

therefore, control the combustion in the kiln at all times.

Variations due to abnormal operating conditions can quickly be detected and compensated for by suitable adjustments of fuel feed, material and air. This results in substantial fuel saving compared with operation without a gas analyzer. This analyzer is now standard equipment with F. L. Smidth & Co., but numerous analyzers have also been installed on miscellaneous kilns, and have resulted in improved kiln performances and fuel economy. The analyzer requires a minimum of maintenance and the operating cost is low.

Electric louvre-drive of a furnace pressure controller on kiln at Bessemer Limestone & Cement Co. plant

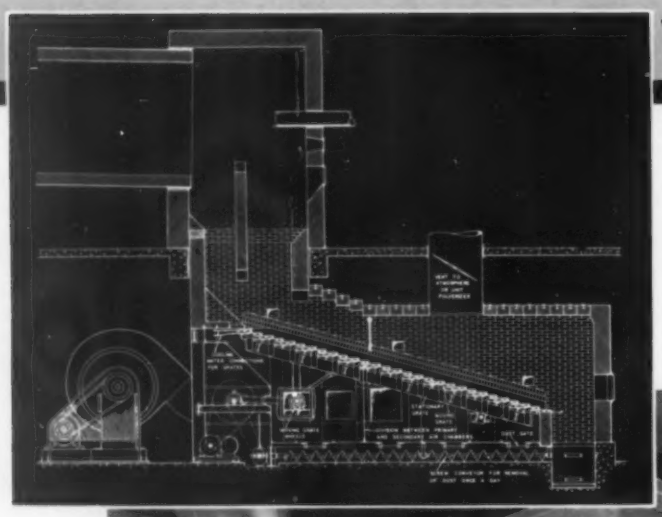
When installing temperature recorders on the burners' platform, it is highly advisable to have these mounted inside a dust-tight enclosure, and for this reason the kiln control panel should be made of the cubicle type with dust-tight doors. The recorders are then mounted inside one section of the cubicle, and are observed through a glass window in front of the panel. It is then possible to attend the recording instruments without the danger of abrasive dust entering the recording instruments causing damage and rapid wear of the recorder mechanism. The extra cost for this type of cubicle panel is a sound investment.

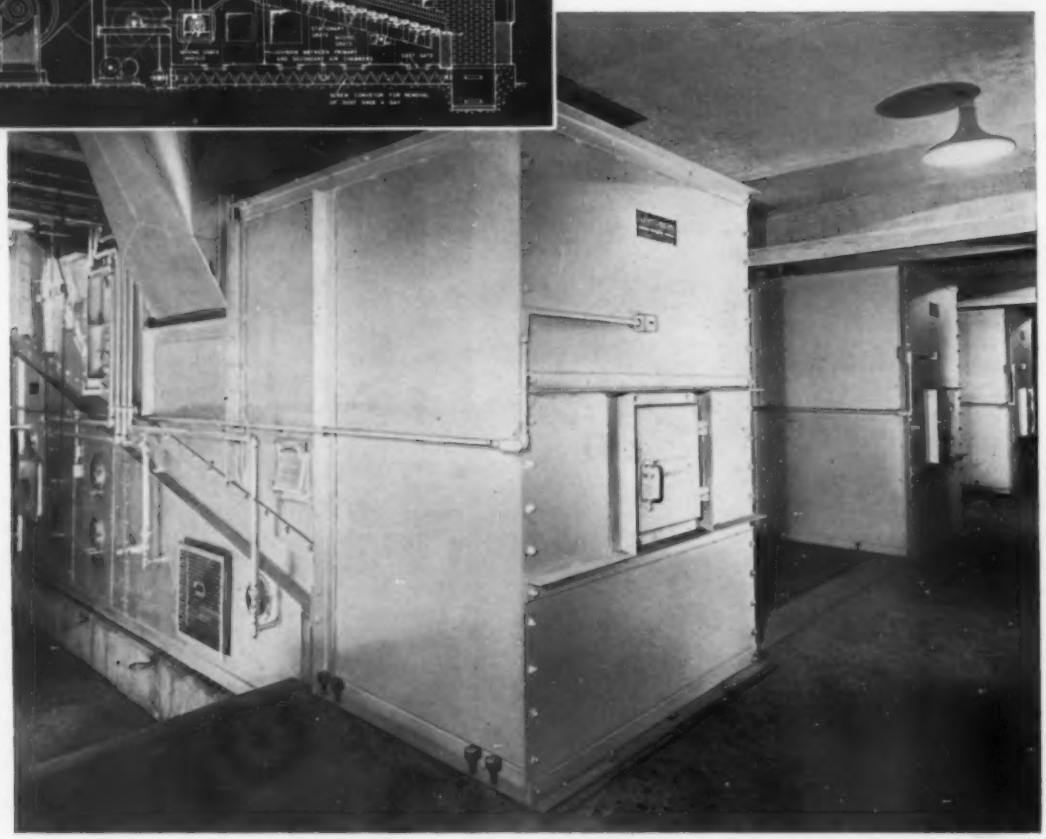
Fig. 2 shows a centralized control panel for a large cement kiln with grate cooler and "Tirax" coal mill. This kiln is equipped with synchronized feeder, draft fan, louvre damper, with remote position indicator, embedded kiln shell pyrometer, flow controller for cooler air, electric gas analyzer and necessary coal mill control equipment consisting of dampers, feeder control and flow indicators. The various instruments are mounted on the panel together with ammeters, speed indicators, recorders, pressure and draft gauges, position indicators for dampers, gas analyzer indicators, temperature indicators, revolution counters, start-stop control switches, interlock switches, relays, alarm relays, indicating lights and sirens.

Fig. 3 shows the control panel for a sintering kiln with recorders for temperature, speed, gas analysis and fuel gas flow, also speed indicators for kiln and conveyor, position indicator, control switches and rheostats for the various d.-c. motors.

The advantage of properly applied control equipment is being recognized more and more by all industries. In the operation of rotary kilns, centralized control achieves uniform kiln output with a resultant improvement in efficiency and lower cost of the product.

MODERN





Three clinker coolers installed by a large cement company. This installation is of the combined recuperator and final cooler type, with divided chamber. Each of these coolers has a capacity of 1000 barrels a day; clinker delivered to the primary or recuperator section at approximately 2500 Deg. F., reduced in the final cooling section to approximately 200 Deg. F.

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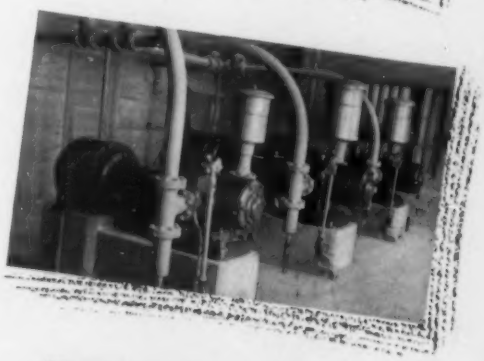
   Designed and built principally for the production of cement clinker of high glass content, to reduce delayed expansion, and obtain other advantages characteristic of high glass-content clinker with efficient recovery of heat and economical complete cooling as inherent features. A three-purpose cooler: abrupt air-quenching, heat recuperation, and final cooling.
7. FINISHED CEMENT COOLER
   For efficient cooling of cement previous to being conveyed to storage. Temperature drops ranging from 100 to 150-deg. F., depending on initial temperatures, have been obtained in actual manufacturing operation.

Fuller Company is fully prepared to assist cement manufacturers in planning to modernize and make changes in many departments, such as installation of Air-Quenching Clinker Coolers, Cement Coolers, Rotary Compressors and Vacuum Pumps, etc. Make your plans now; be ready to act at the first opportunity. Fuller engineers will be glad to discuss the economic application of Fuller equipment in your plant.



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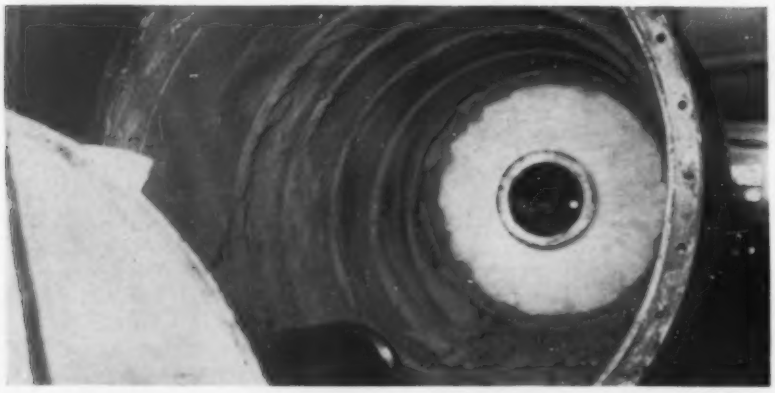
CLASSIFYING

Centrifuge Steps Up Grinding Efficiency



Above: Showing how coarse material is thrown to the outside of the centrifuge where the conveyor blades work it toward discharge opening. Below: Outer surface of screw conveyor unit in centrifuge. All slurry passes through openings. These openings are rebuilt with hard-surfacing material as they become worn

By WALTER B. LENHART

Lone Star Cement Corporation installs centrifuge in closed-circuit with tube mills to remove hard shell "nibs" from slurry

THE HOUSTON, TEXAS, plant of the Lone Star Cement Corporation is one of the few plants in the country using oyster shells as raw materials. Most of the shell grinds readily, but that portion making up the hinge is very tough. With normal grinding, its inclusion in the raw mix results in rather large flat particles, and in order to reduce this to a fineness or size suitable for cement burning, these tough pieces or "nibs" literally have to be worn out. If this is done in the usual open circuit grinding, it results in excessive fineness of the major part of the slurry with a corresponding increase in power requirements and reduced tube mill output.

After extensive studies, the Engineering Department of the Lone Star Cement Corporation decided about two years ago to install a Bird centrifuge in closed circuit with

Left: This 4-in. pump handles discharge from centrifuge. Center: Pump handling rejects from centrifuge. Right: Feed pump for centrifuge

the tube mills. This installation was completed in February, 1941, and after some minor changes in the design of the machine and the general arrangement of the installation, it accomplished the desired result and has become a part of the raw mill equipment.

Removes Shell "Nibs" from the Fines

Before the centrifuge was installed, the shells first went to the No. 85 Smidth Kominuters which operated in closed-circuit with a battery of Utah vibrating screens. At first screens having an .05-in. opening were used. This gave low capacities so the openings were enlarged to 0.10-in. At this point the centrifuge was installed farther along in the system, so that while the No. 85 Kominuters are still used it was possible to enlarge the screen openings again to 0.125-in., with a large increase in mill capacity. Still later 0.140-in. screens were installed and again the capacity was increased correspondingly. At the time of inspection the 0.140-in. screens were in use.

The flow sheet indicates more clearly the manner of use of the centrifuge.

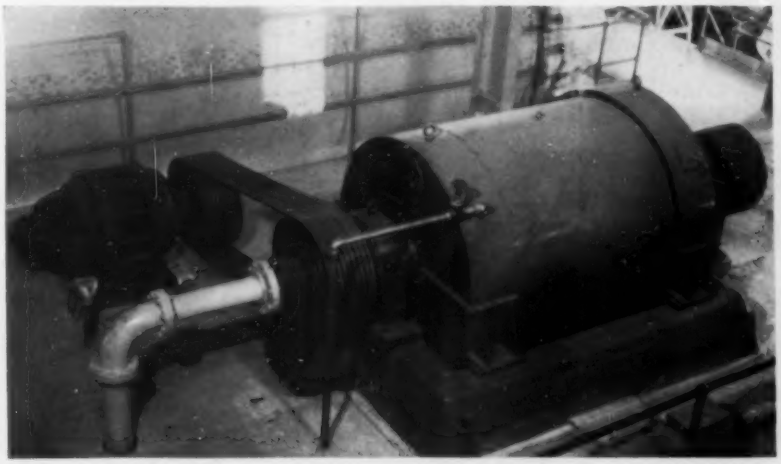
As now processed, the minus 0.140-in. material, which incidentally is the entire raw mill flow, goes to four No. 18 Smidth tube mills. These mills deliver to the centrifuge by means of a 4-in. Morris pump driven by a G. E. motor through Gates V-belts.

The centrifuge makes two products, fines and rejects; the rejects consisting of the coarse portion of "nibs," which is roughly 8 to 10 percent of the total tonnage, passed through the machine. Actually there is only 3 to 4 percent of the coarser oversize, but the included fines rejected by the machine make up the above totals as indicated.

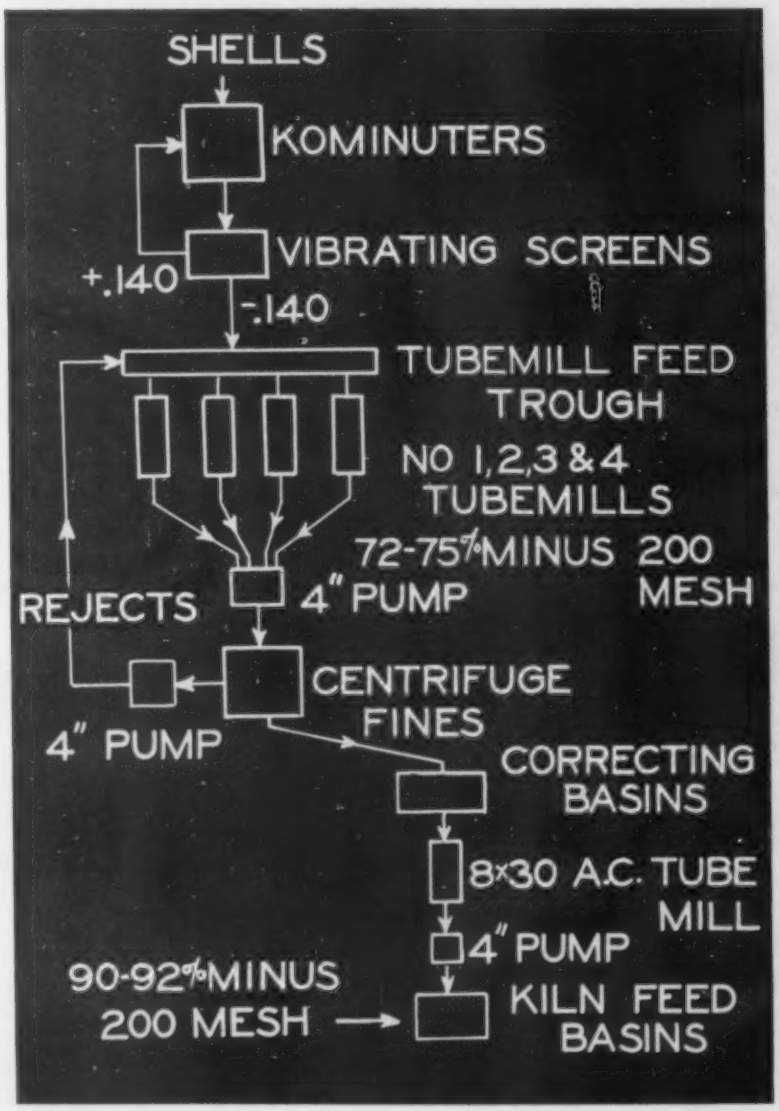
The rejects are pumped back to the tube mill feed trough and then passed through the tube mill for further grinding. The fines go to correcting basins where they are analyzed and mixed. They then go through an 8- x 30-ft. tube mill and the finished slurry is pumped into the kiln feed basins.

Step Up Mill Capacity

About a year ago the Houston plant of the Lone Star Cement Corpora-



Centrifuge serves as a classifier in removing hard, flat particles from ground shell slurry



Right: Flow sheet of raw grinding operation depicting how centrifuge classifier functions in the circuit

tion installed its fourth No. 18 Smidth tube mill. This addition, plus the increased capacity of the Bird centrifuge brought the capacity of the mills up to 2,000,000 bbls. per year. Thus better than 6,000 bbls. of raw mix are screened per day, which is obviously a large capacity for a machine taking up so little floor space. The centrifuge is 54- x 70-in. and is driven by a 100 h.p. G. E. motor through an Allis Chalmers texrope drive.

The Bird centrifuge has been in practically continuous operation since May, 1941, and for the past year it has been in continuous service without an overhaul. The company likes the performance of the centrifuge both from a mechanical and processing standpoint. When asked if they had it all to do over again what would be their program, they replied that they would do just what they did, although a machine slightly larger would better handle the larger capacity it is regularly handling.

Wear in the machine is confined to the inner cone or conveyor. The port holes through the inner shell become elongated so a spare conveyor is kept on hand. These parts and other surfaces subjected to heavy wear are built up with hard surfacing welding.

At this installation the r.p.m. of the outer cone is kept at 400 r.p.m. with the inner cone at 393 r.p.m. These speeds are controlled through a planetary gear unit in conjunction with variable speed motor. At the outset the proper speed and its accurate control gave some trouble but all these minor things were ironed out during the early experimental stages.

L. J. Wheeler is superintendent, and W. H. Tilley is chief chemist of the Houston, Texas, plant.

As the Bird Classifier is a comparatively new type of equipment in the rock products industry, and apparently has applications in fields outside of the cement industry, an illustrated description follows on this page.

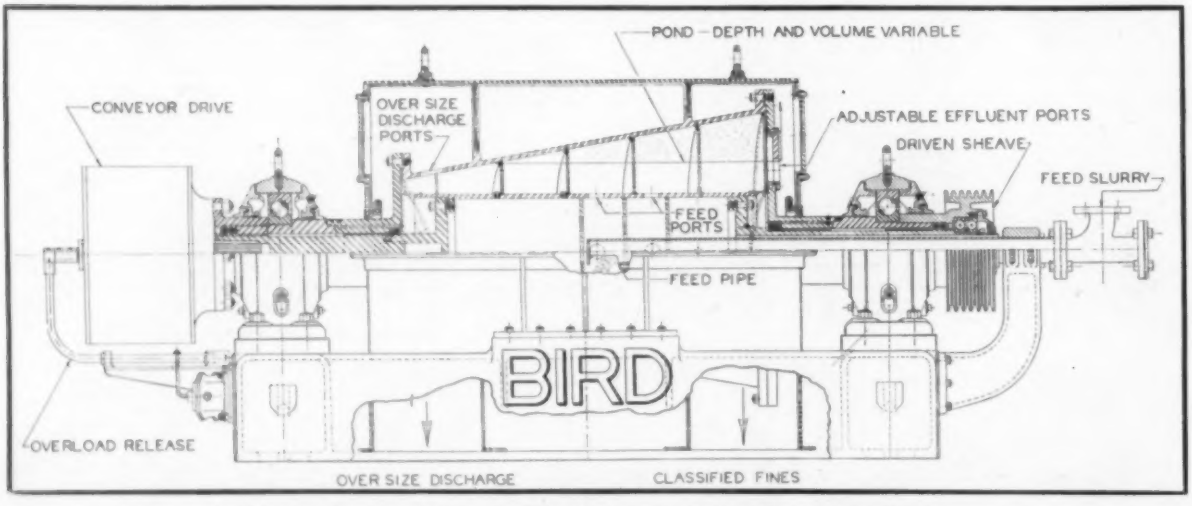
Continuous Centrifugal Classification

In the accompanying illustration may be seen the construction of the Bird Classifier now employed in several cement plants to classify particles according to particle size from slurries containing a mixture of fine and coarse solids. In addition to serving as a classifier, it also functions as a dewaterer. There possibly may be other applications for this equipment in the sand and gravel and other industries where classification and dewatering problems are encountered.

As indicated in the cross section illustration, the feed slurry is delivered through a stationary feed pipe to a revolving bowl, shaped like a truncated cone. A screw conveyor rotates inside the bowl at slightly lower speed, in the same direction of rotation. The differential rotation between conveyor and bowl, obtained by a gear drive, has no effect on the settling of solids against the walls of the bowl. The desired degree of separation is obtained by controlling the feed rate and the amount of centrifugal force. Separating forces ranging up to 1000 times gravity are developed. The fine particles are carried out with the liquid at the point shown in the illustration. The oversize solids are thrown against the bowl wall by centrifugal force, picked up by the screw conveyor and carried to the smaller end of the bowl where they discharge through ports. When a thoroughly drained coarse fraction is desired it can be obtained by controlling the pond depth so that the smaller end of the bowl is not submerged.

Safer Blasting Methods for Quarries

Bureau of Mines has issued a new publication, describing the structural features of detonators used by the mineral industries, according to an announcement by Dr. R. R. Sayers, Director. Quarries, coal and metal mines are the heaviest users of industrial explosives, and last year their purchases of permissible explosives, black blasting powder, and high explosives totaled about 385,000,000 lb. The publication was written by R. L. Grant, assistant chemical engineer of the Bureau. In describing new trends in the development of detonators, the report comments: "Recent developments accelerated by wartime scarcity of metals, indicate that synthetic plastics and resins may find use in future detonators." This publication, report of Investigations 3696, "Structural Features of Typical American Commercial Detonators," may be obtained from the Bureau of Mines, Department of the Interior, Washington, D. C.



Cross section of continuous centrifugal classifier showing details of construction

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WAR PRODUCTS

Utilizing Idle Rotary Cement Kilns in the War Effort

By A. BRIX ANDERSEN*

ON DECEMBER 7, 1941, the signal was given to the industries of the United States to perform the greatest miracle of production ever conceived. One of the first industries to feel the call for increased production was the cement industry, because cement is one of the most essential components in building up the facilities for our armed forces and the war industries proper.

By pressing into production all available equipment, including in many cases even old and obsolete machines, the cement industry was ready to meet practically any demand for cement that could be made, and it is one of the few industries in this country that could meet the increased demands without resorting to large-scale building of new plants and installation of new equipment. At short notice the cement flowed in greatly increased quantities from the cement factories all over the country.

The period of large-scale construction is now practically over, and the period of maximum production of actual war materials has arrived. This change will be keenly felt as a substantial decrease in the demand for cement until post-war production begins. The question may be asked, "Has the cement industry done its part toward the winning of the war and must it now sit back and wait for the post-war construction program to increase the demand for its product?"

If this were to happen, the industry in the coming year (on an average) may have to shut down every second kiln, and this would mean not only a loss to the individual companies, but also a loss to the nation in the war effort if such idle machinery might be used for other purposes in furtherance of the winning of the war.

The Concrete Materials Section of the War Production Board has long been aware of this situation and on March 24 it released a letter addressed to all cement manufacturers which urged them to convert unused kiln capacity to processing other war essential minerals. This letter was published in ROCK PRODUCTS, June, 1943, page 54.

The answer to the question whether the cement industry has to remain partly idle for the duration of the war is "No." There is a large number of other industries that use rotary kilns for various purposes; and in many instances cement companies may be able, with little time and expense, to convert all or part of their idle plants to the production of materials still in great demand. This procedure has two great advantages; the first one is an all-important saving in time because the time required to convert cement plants to such other purposes as may be suitable is short compared to the time it would take to manufacture and install the corresponding new machinery; the second is that large quantities of strategic materials will be saved by the cement plants taking over processing of such products, for which new plants and machinery would otherwise have to be built.

● *THE ACCOMPANYING ARTICLE was prepared at the request of the editors of ROCK PRODUCTS in view of the great interest that is being aroused among portland cement manufacturers over the possibilities of making some war use of their plants. According to a recent statement by Francis A. McAdam, chief, Concrete Materials Section, W.P.B., 11 cement plants are now making other than portland cement; the list of products includes lime, sintered or nodulized ores, phosphate, bauxite. Of these, six are making nodulized iron ore. It is anticipated that at least 20 cement plants will be on war products by the end of the year.—The Editors.*

No Insurmountable Difficulties in Converting Kilns to Other Uses

The cement manufacturer may say that this is all very well, but that he is a specialist in producing and selling cement and perhaps it is too difficult for him to go in for entirely new processes about which he, his plant managers and staff know nothing. The Concrete Materials Section of the War Production Board in its letter offers to help the cement manufacturer by putting him in touch with the war agencies interested in getting materials processed in the cement plants. This solves one of the big problems facing the cement manufacturer. To solve another and equally big problem, namely: how to convert and run his plant according to a new process, the cement manufacturer may have to rely on the advice of engineering companies which have specialized in the particular process or processes the cement manufacturer chooses to take up. Usually it will only take a short time to convert the plant and educate the staff and labor to the new process, and, after a short period of running, the cement manufacturer will usually be as familiar with the new process as he is with the process of making cement.

The equipment in a cement plant which is of interest in this connection is, generally speaking, crushers, grinding mills, and rotary kilns. In rare cases flotation equipment also may be available. Idle machinery of all these categories may be utilized in the war effort, but the cement manufacturer will find that the idle machine which is of prime importance is the rotary kiln, while the crushers and grinding mills may be considered as more or less auxiliaries which are required by some processes and not by others. The

*Assistant to Vice-President, F. L. Smidth & Co., New York, N. Y.

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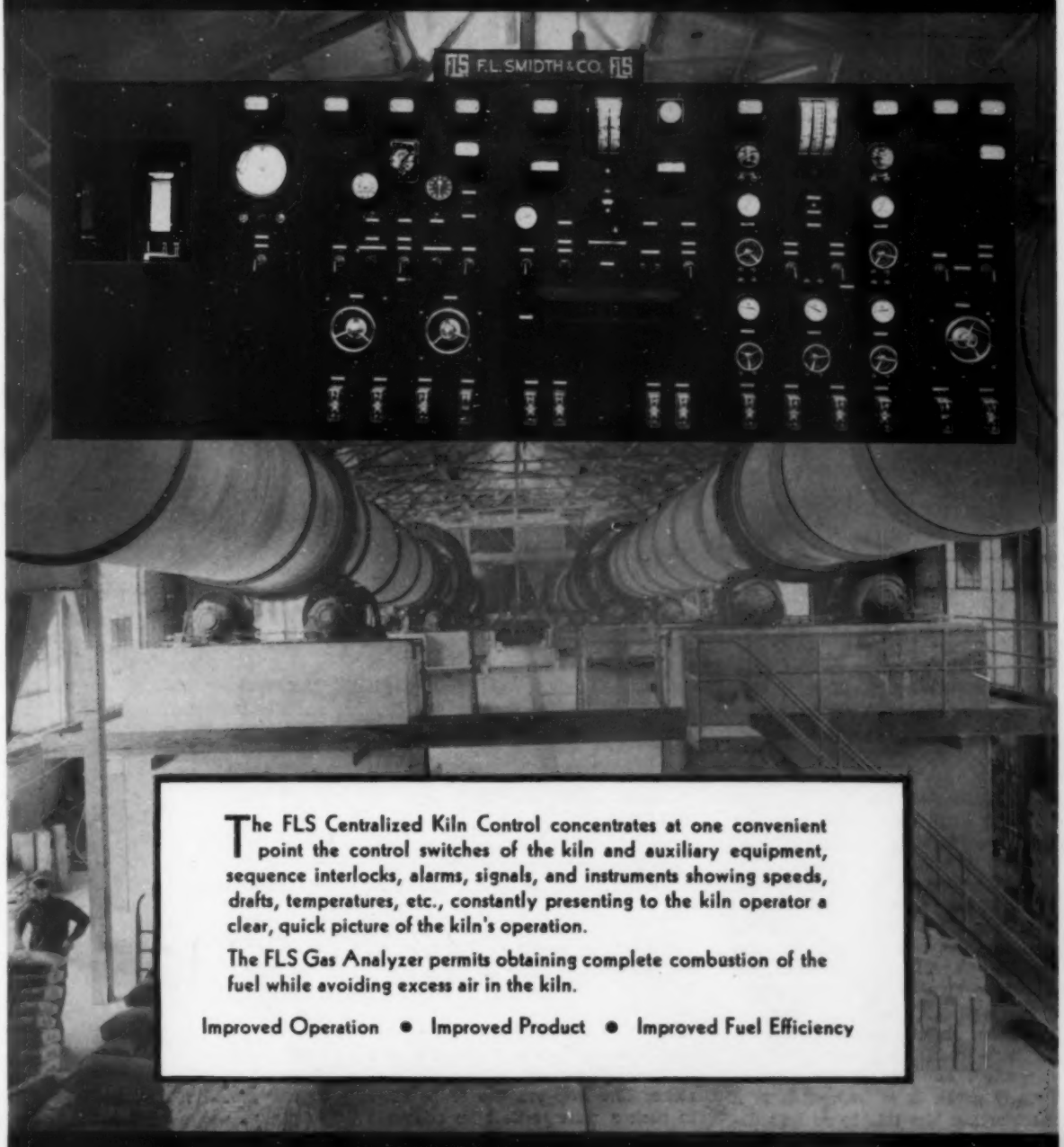

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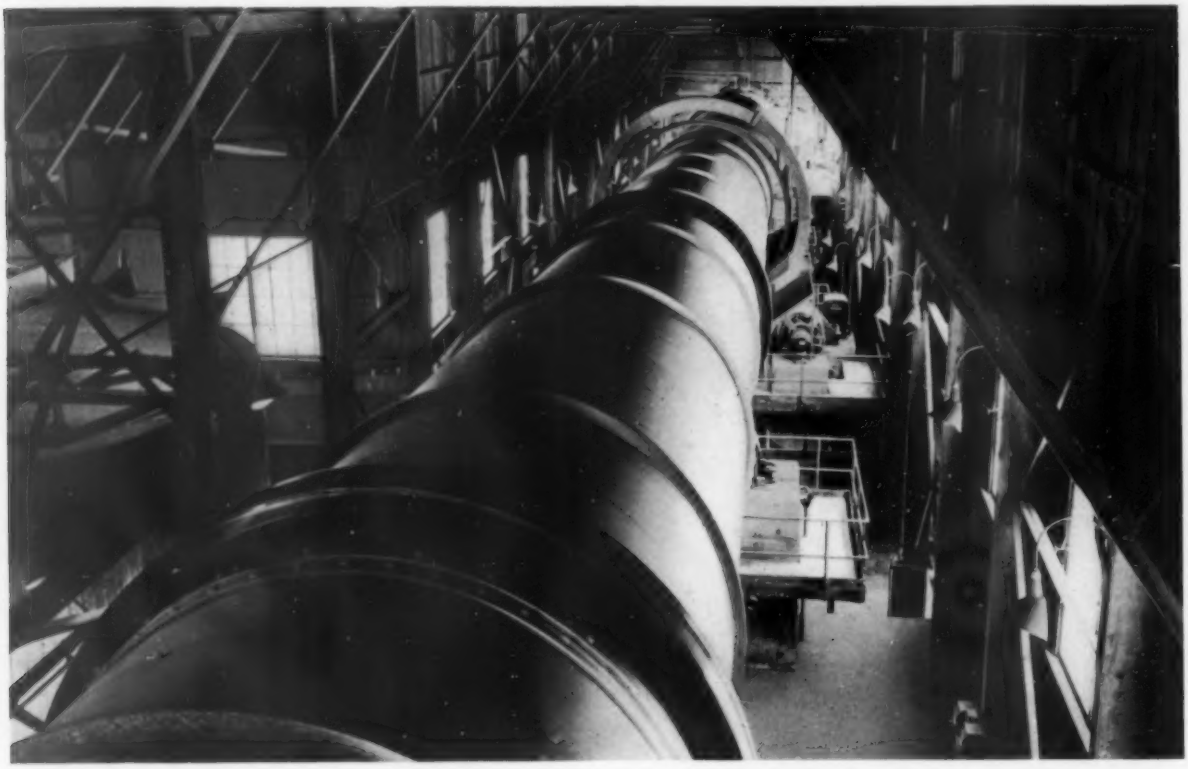

Rotary kiln which is being used for sintering ore. Very few changes were required to convert the cement kiln

company with which the writer is identified has for many years specialized in rotary kilns, not only for the cement industry, but also for a large number of other industries. For this reason, it has been in contact with a great many processes in which the rotary kiln is and can be used, and it has adapted the rotary kiln in various ways to suit each individual purpose in the best possible manner.

Rotary kilns, in all essential features similar to the rotary kilns used by the cement industry, are today used in the process of manufacturing such important products as iron and steel, manganese, nickel, aluminum, magnesium, zinc, tin, lime, refractories, phosphates, and dolomite. All these products are essential in the war effort and the demand is extremely great. It is impossible in a short article like this to go into details about how the cement manufacturers may convert their plants to one or more of the processes in question, and it should only be mentioned that at this precise time there are several cement plants already making new products, and, no doubt, many more will shortly follow.

This article will be confined to dealing with one of the most important processes to which the cement plant may be converted, namely: the process of agglomerating iron-ore fines, blast-furnace flue dust, and other iron-bearing materials. This process is important because the demand for the product is very great, and the conversion to this process is in most cases extremely easy to undertake.

Agglomerating Iron Ore and Blast-Furnace Dusts

The great expansion of the wartime steel industry has tremendously increased the demands of the blast-furnace operators and open-hearth operators for larger and larger quantities of iron-ore sinter or nodules. The blast furnace is charged with a mixture of iron ore, coke, and limestone. The iron-ore has to be sized in such a manner that an adequate surface is presented to the reducing gases, and at the same time offer suitable resistance to the blast. In order to avoid blowing ore out with the blast, fines of a size smaller than 1/16 to ⅛ in. and dust can not be charged into the blast furnace without prior treatment. To render such fines and blast-furnace dust suitable for treatment in the blast furnace, they are sintered or nodulized. This means that the ore particles are heated to a suitable temperature, whereby they are partly fused and bound together.

Originally, the blast-furnace operator used only so much sinter or nodules as he was forced to do, owing to the quantity of fines he received, but it is now generally recognized in the steel industry that increased capacity, lower fuel consumption, and improved operation of the blast furnace result from the use of increased quantities of sintered or nodulized ore. By using the sintered or agglomerated ore on a larger scale it is also possible to use beneficiated ore, as well as various by-products rich in iron that are frequently obtained in a finely-divided state, and, therefore, can not be used in the blast furnace without prior treatment.

Opinions differ with regard to the optimum percentages of sinter or nodules desirable in the blast-furnace burden and with regard to the merits of sintering or nodulizing and all other forms of agglomeration and partial reduction of the ores, but it is a fact that under present conditions the steel industry can utilize and actually needs a far greater agglomerating capacity than that

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now in operation. This situation has created considerably renewed interest in the use of rotary kilns for these purposes, especially since there are numerous idle cement kilns that might be converted, by the use of a minimum of critical material. This conversion of idle cement kilns would, no doubt, greatly help to satisfy the demands of the steel industry for iron-ore agglomerates. Lately some cement plants have been converted, either wholly or in part, to nodulizing, and, others are likely to follow.

Knowledge Gained by Experience

Nodulizing in plain rotary kilns was undertaken more than thirty years ago, but the initial experience was rather discouraging both from the standpoint of economy and operating efficiency, although the nodules were found to be satisfactory in blast-furnace operation. The main difficulty encountered was the tendency of the materials to adhere to the lining in the hot zone of the kiln, causing the formation of "rings," which necessitated frequent shut-downs and otherwise interfered with efficient kiln operation; consequently, special types of rotary nodulizing kilns were developed in which provision was made to combat the formation of rings and their easy removal by means of specially designed scraper bars, etc.

In this connection it should be mentioned that the presence of from 2 to 5 percent of carbon in the feed to a nodulizing kiln normally improves the general performance of the kiln and makes it possible to obtain a substantially increased output. The presence of carbon is particularly important if low B.t.u. fuel, such as blast-furnace gas, is used for heating the kiln. Where iron-ore fines are nodulized together with flue dust, the two materials may be proportioned in such a way as to provide the desired carbon content; and where only iron-ore fines are nodulized the carbon is added in the form of low cost carbonaceous material, such as coke breeze or coal screenings. The advantages of carbon in the feed have been known for many years and the additions of carbonaceous material have been employed for kilns nodulizing iron-bearing materials, as well as other ores, operating either on the dry or the wet process. The research laboratory of the company with which the writer is identified has, along with its general research on nodulizing, made extensive experiments with coke and coal additions to ores to be nodulized.

The cement industry may ask why it is possible today to use ordinary rotary kilns for nodulizing iron ore since it was impossible years ago. The answer is that since that time much experience has been gained; rotary kiln design and operation technique have improved to a great extent; and, last but not least, new agglomerating processes have been developed that have immensely facilitated the performance of the rotary kiln. Therefore, the situation is vastly different from what it was thirty years ago.

Special Research Done

More than a year ago the research laboratory of the company with which the writer is identified began investigating and developing means of rendering the plain rotary kiln suitable for nodulizing. The work originated from a series of experiments undertaken at the suggestion of the War Production Board to determine whether it might be possible to produce satisfactory grinding bodies for ball mills to substitute for steel balls and thus conserve critical war materials. The experiments were based on the idea of casting the grinding bodies employing iron ore, to which lime or other ingredients had been added. The results were negative in that it proved impossible to produce a satisfactory grade of balls, but the experiments gave the incentive for the development of a new process of nodulizing iron ore.

The results of this work have so facilitated kiln operation that plain cement kilns may now, with minor modifications, be satisfactorily used for this purpose. The process that has been developed and for which patent is pending, uses a so-called agglomerating agent, of which a minor quantity is mixed with the ore. The melting temperature of the agglomerating agent is considerably lower than the melting temperature of the ore itself. The mixture of agglomerating agent and ore is heated to a temperature that is slightly above the melting point of the agglomerating agent and considerably below the melting point of the ore. The agglomerating agent melts and binds the ore-particles into nodules. In order to make this process available to the war effort on the largest possible scale, a license to use it for the duration may be had by any one who wishes for a small token license fee. The usefulness of this method has not only been thoroughly established in laboratory kilns but recently also by a large-scale industrial test sponsored by the Government at a cement plant in the East.

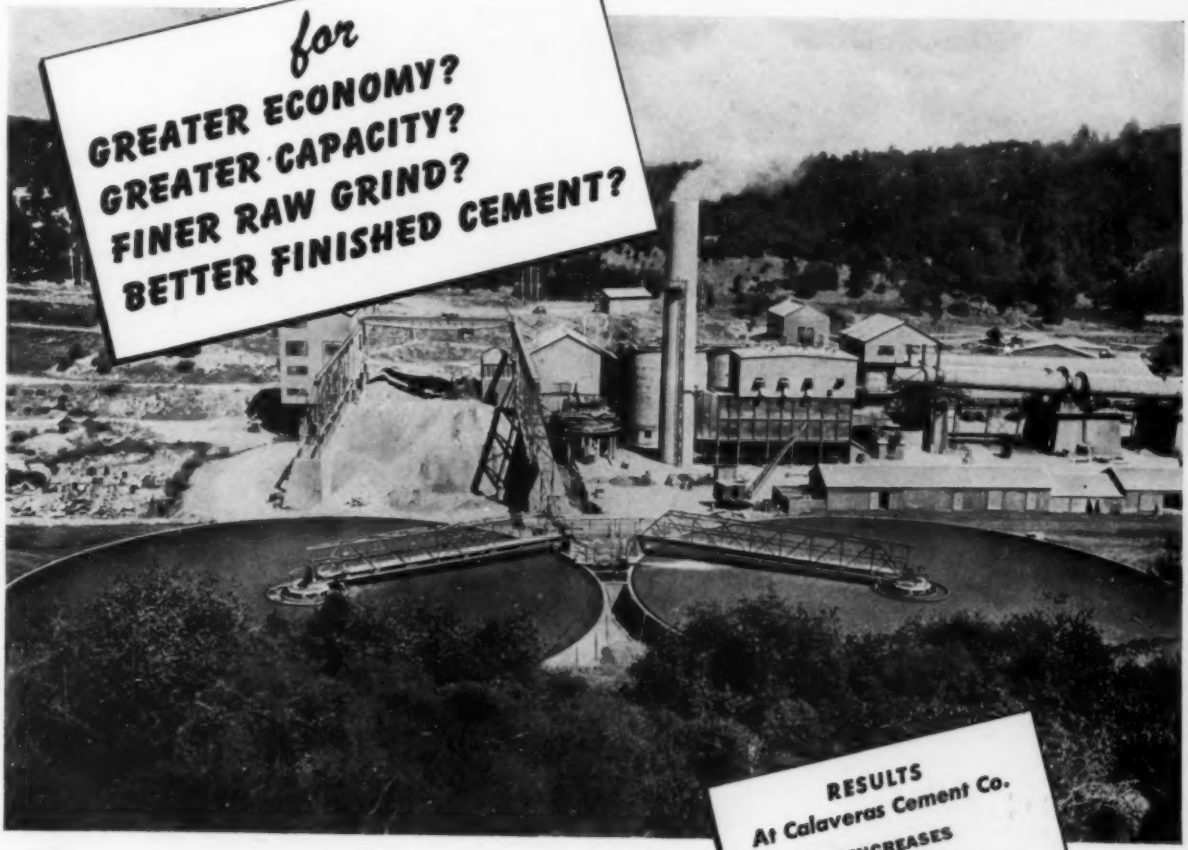
Another method for obtaining improved nodulization has been developed by the Universal Atlas Cement Co., and is now in practical use in some cement plants. The method is based on the addition of crushed limestone to ores which are low in lime.

Nature of Agglomerating Agent

The agglomerating agent used in the first-mentioned method is made

Sample of nodules which have been produced in a rotary sintering kiln

Want to convert your wet process cement plant



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from a mixture of iron ore and limestone ground together in a mill, to ordinary cement raw-mix fineness of, say, 90 percent through a 200-mesh sieve. By way of an example, if the limestone available at the cement plant has a calcium carbonate content of, say, 90 percent and if the ore to be sintered is hematite with, say, 55 percent Fe, the agglomerating agent would be made by grinding a mixture of 20-25 percent limestone to 75-80 percent iron ore. The control of the mix is effected by means of titration of the carbonate in a manner similar to that by which a cement raw mix is controlled, the difference being that in preparing the agglomerating agent, greater fluctuation in composition may be permitted than in a cement raw mix and the control is, therefore, much easier.

The agglomerating agent may be made wet or dry according to what is most suitable for the cement plant in question. If it is a question of a wet plant, the agglomerating agent will most likely be made as a slurry containing the normal amount of water, such slurry being stored in the available slurry tanks and pumped by the available slurry pumps in the cement plant. If the cement plant is a dry plant, the agglomerating agent may be prepared dry and handled by the ordinary equipment in the cement plant normally used for handling raw meal.

Plant Conversion

The iron-ore fines would usually arrive at the cement plant in open, dump cars; and generally the largest job of conversion of the plant to this process is to arrange for the conveying of the iron-ore fines to the feed end of the rotary kiln. Generally, it will be preferred to unload the iron ore into the raw-material storage of the cement plant. Usually, in the course of cement manufacture, the raw materials are conveyed from the storage to the raw-grinding plant and in preparing the agglomerating agent these same means of conveyance can be used without any modification. However, the major portion of the iron ore has to be conveyed directly from the storage to the feed end of the kiln. In ordinary circumstances, a system of belt conveyors and elevators will be needed to perform this transportation. In most cases, however, the installation of conveying equipment for the iron ore to the feed end of the kiln can be made at small cost and in many cases, the cement plant may find that it has sufficient equipment on hand which can be dismantled and re-erected for this purpose.

Normally, the iron ore should be fed to the kiln through a large feed pipe 14 to 24 in. in diameter. The agglomerating agent, whether it is in the form of a slurry or a dry raw meal, can be fed to the kiln by the usual means with which the raw mix is fed to the kiln. Suitable means of controlling the proportions of ore and agglomerating agent should be provided. The temperature in the burning zone, or, as it is called, nodulizing zone, should be between 2200 and 2300 deg. F., which is considerably lower than that required when burning cement. There are no special requirements for the firebrick lining in the kiln, and owing to the relatively low temperature and absence of chemical reaction in the burning zone, the wear and tear on the firebrick is small.

Kiln Capacities

The output that may be expected from the kiln when nodulizing iron ore is considerably higher than the corresponding output when making cement. It is estimated that the output of nodules will be between three and four times as high as the output of clinker. So that the cement plant may operate on an economical basis, it is of the greatest importance that the cement kiln thus converted be made to produce its absolute maximum output of nodules and frequently an increase in the speed of the kiln is needed to achieve this end. A suitable speed of the kiln for nodulizing iron ore is, for instance, 1 to 3 r.p.m., depending on the diameter. Should the present arrangement of the kiln not permit such speed, the change of the kiln to this speed will frequently require only a change of pulleys or a set of gears, which generally can be done at small cost.

The heat consumption per ton of nodules is about one-third to one-fourth the heat consumption of a ton of cement clinker, and cement operators will, therefore, find that they may obtain a satisfactory output of nodules from their cement kilns by using the existing firing equipment more or less to its full capacity.

Handling Product

The nodules leaving the nodulizing zone of the kiln will harden immediately when they are cooled below a temperature of about 2100 deg. F., and they then look and behave more or less like cement clinker, the only difference being that the average size of the nodules is required to be larger than the average size of cement clinker.

The majority of existing cement kilns are provided with various kinds of coolers for cement clinker and in most cases these coolers readily, or with slight modifications, can be used for the handling of the hot nodules. It is important that the nodules contain as little fines as possible, and, therefore, the handling of the nodules should be somewhat more gentle than the handling usually given to cement clinker. For instance, if a cement plant is provided with an underlying rotary cooler provided with lifters, etc., such lifters should be removed, because the rough handling given the nodules by the lifter system is apt to cause excessive wear on the nodules, thereby producing undesirable fines.

The capacity of the existing coolers will normally be found to be adequate for the nodules. True enough, the amount of nodules produced is much greater than the amount of cement clinker produced, but, on the other hand, the heat in the nodules is somewhat lower than the heat in the corresponding amount of cement clinker. Even so, it may not be possible to cool the nodules as much as the cement clinker is normally cooled. Generally, it may be said that in order to produce nodules as economically as possible, the maximum output is of far greater importance than minimum fuel consumption. Therefore, the manufacturer will generally find that from a heat-recovery standpoint he can afford to discharge the nodules from the cooler at a considerably higher temperature than he normally maintains for cement clinker, so long as he obtains the highest practicable output of nodules. The requirements so far as actual cooling is concerned are that the nodules should be sufficiently cooled to be loaded directly into open steel cars for transportation to the steel plants.

Normally, a cement plant may not have facilities for loading cement clinker directly from the cooler into the railroad cars and in most cases it will, therefore, be necessary to build some sort of a conveyor to take the nodules directly from the cooler and dump them into railroad cars.

(Continued on page 122)

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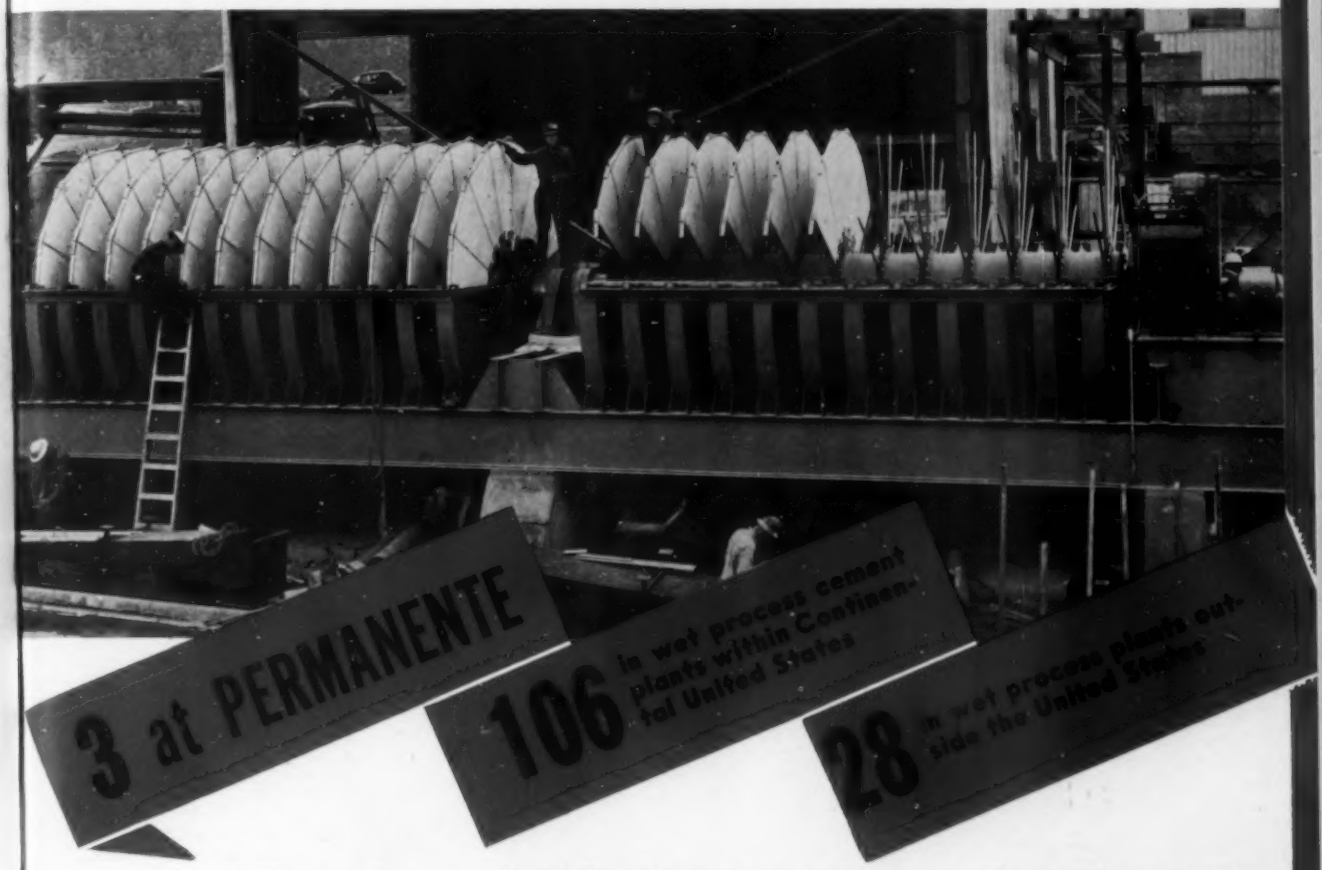
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They also imply rather strongly that Oliver United engineers, who back in 1925 made the first practical installation of continuous slurry filters in a Michigan plant, are thoroughly conversant with the subject. They also imply that Oliver United has available operating records which would be helpful in applying it to other wet process plants or to dry plants planning to shift over.

And they suggest that other plants not now equipped with American Slurry Filters should change over in order to cut fuel costs, improve kiln operation, and reduce kiln maintenance.

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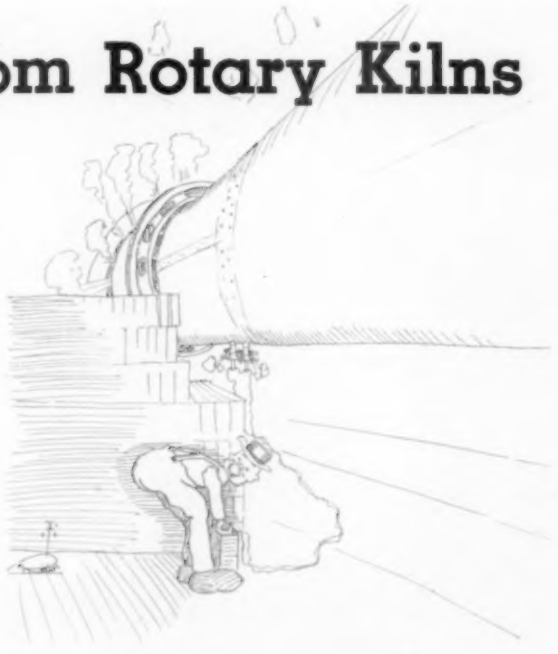
Blasting Rings from Rotary Kilns

Typical procedure followed by kiln operator in the removal of ring and heavy coating formations by the blasting method

By RALPH GIBBS*



Blasting out a troublesome kiln ring

PREVALENCE of ring and heavy coating formations in rotary kilns is practically all-inclusive. It is true that in certain applications rings or heavy coating are not major problems, but occasionally they do form even in these rare instances and thus entail the usual trouble and loss of production associated with this affliction.

The frequency with which these troublesome and aggravating formations occur depends upon many factors. In some instances, such as the sintering of certain types of ore, they form in a period of three or four hours. In others, weeks or even months may go by without serious interference to kiln operation or production.

Most rotary kiln operators would be quite surprised to know the vast amount of time, thought and energy being devoted to the general problem of contending or removing rings and heavy coating. Almost without exception each responsible rotary kiln operator has devised or is devising some plan or apparatus for the prevention or elimination of these pests.

Two years ago the writer's attention was called to the Cardox-Cliffe† method of blasting rings and heavy coating from the walls of rotary kilns.

After studying the principle of the thing, the reaction was one of extreme scepticism. Why, such a method surely was as full of bugs as a hound-dog! A further perusal of the drawing showing the location of the ports, the various attachments, and the description of the steps taken in performing the blasting served only to increase the sceptic attitude.

*Consulting Chemical Engineer, York, Penn.

†Letters Patent were issued November 10, 1942, to W. R. Cliffe, of Hershey, Penn., on "Method and Apparatus for Removing Fire Rings from Rotary Kilns." No. 2,301,855.

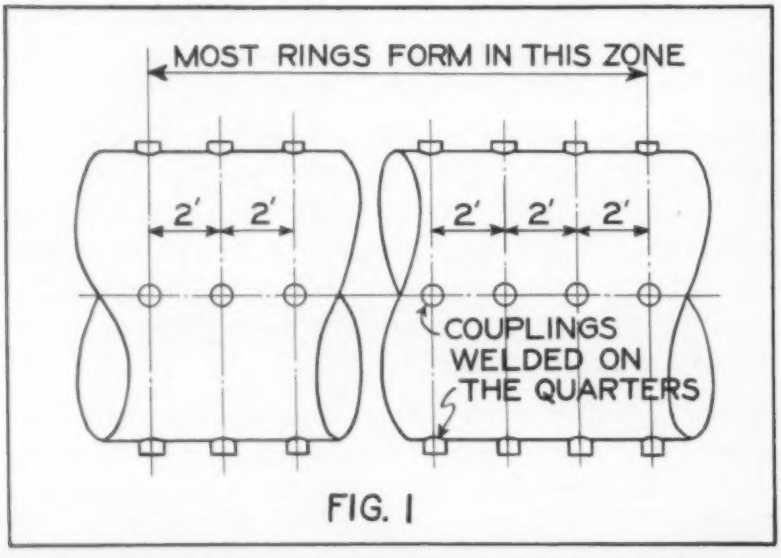


Fig. 1: Position of blasting ports for new method of ring and coating dislodgement

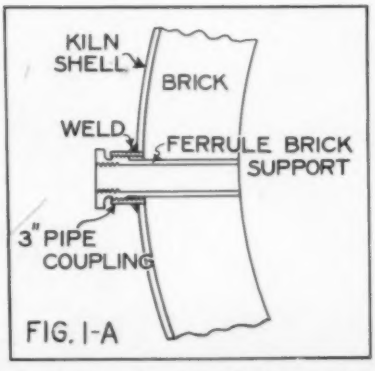


Fig. 1-A: Ferrule replaceable from outside

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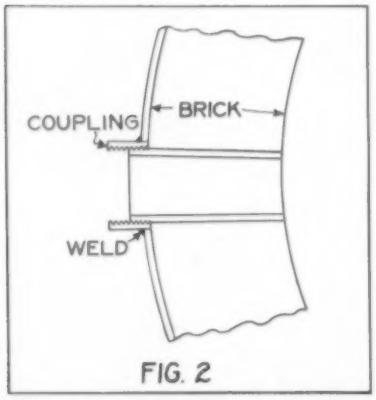


Fig. 2: Ferrule replaceable only from inside

And the preparations that were necessary to apply the blasting process were open to all sorts of objections. So many openings had to be made in the kiln on 2-ft. centers! When would we ever get the time to cut the holes in the kiln sheet and weld the couplings in place? It all seemed so impracticable. Wouldn't we weaken the kiln shell by putting so many holes in it? Of course they are to be located on the quarter, or 90 deg. in a line instead of spiraled as originally laid out. And the brick lining? Wouldn't it suffer tremendously from this harsh treatment?

Finally, yet still sceptical, we grudgingly admitted to ourself there was a bare possibility that the thing might work as described, and half-heartedly went about the uninteresting business of preparing for a trial "with the full knowledge" the whole thing would be a "flop."

The necessary parts were ordered and the plant shop was assigned to perform the required machine work, "when they could work it in." We did not push the shop for this work, knowing they were busy with other and more essential duties. There was no hurry in bringing on failure anyway, we told ourselves as we continued to build up our case against the "new idea." Is not the refractory lining going to be blasted to pieces around the shell ports? Is not the material composing our rings and coating different from those in other operations? How are we going to locate the position of the ring with any assurance of getting an effective shot? And so many holes to put into the kiln!

We all gather around at the fateful time, from brass hats to the most humble laborer. The prospect of witnessing abject failure created a democratic atmosphere conducive to low-voiced conversations in constantly shifting little groups of incredulous witnesses. The brass hats and the laborers exchange their opinions with equal candor. The bars of authority are let down. We all are spectators, sceptical spectators, and official and class distinctions among spectators does not exist.

Steps in the Removal of Kiln "Ring" by Blasting

From the stock room or store room are brought the shells or cartridges, covered with the dust and shelf-wear of weeks or months. They have been charged with liquid carbon dioxide (if the temperature is below 88 deg.) which will be instantaneously and completely gassified by a chemical heating mixture ignited by an electric exploder when the blast is made.

Each Cardox shell is marked with the filled or charged weight, and this weight has been checked to be sure the full charge has been retained.

The fire has been taken off, and on looking into the kiln the ring is clearly seen in all its incandescent massive bulk. High temperatures do something to light which makes the accurate judging of distance extremely difficult. Experience is necessary to determine even an approximate location. The rotary kiln foremen and burners, accustomed to gauging positions in the hot kiln, are the best judges.

An approximate position is selected and the plug removed from one of the ports nearest to the chosen point. The drilling guard is screwed into the port coupling, and a laborer with a light-weight jack hammer drill starts drilling a hole into the accumulated coating.

The installation of these ports was not as difficult as it seemed originally. Fig. 2 shows how they were installed.

The first drillings to come out are black and fairly cold, but soon, as penetration becomes deeper, they come out red hot and suddenly, with a jolt, the entire coating is penetrated. the exact location of the ring has been missed.

A length of 1-in. pipe is quickly thrust through the hole just made, and an observation of its position is taken as it is held extending into the kiln. With this pipe as a guide, the exact location of the ring usually can be determined. The pipe is then withdrawn and the port closed with a piece of brick and then the plug screwed in. A little graphite on the threads, and only turning in the plug two or three threads make later removal much easier.

The plug at the newly chosen location is removed and the drilling operation repeated.

During this time, the proper depth to drill the hole has been determined. The refractory lining at this position is 9 in. thick, the thickness of the kiln sheet is ¾ in. and the coupling extends 2½ in. from the kiln sheet. Thus we have 12¼ in. from the inside surface of the refractory lining to the top of the connector coupling. The gas escape ports of the Cardox shell should be 1 to 2 in. beyond the inside surface of the refractory lining, and these gas escape ports are about 3 in. from the end of the shell. Thus we have about 4½ in. to add to the above distance or 16¾ in. from the outer edge of the coupling to the base of the drilled hole. By allowing for the space of the drilling guard, the drill itself can be marked, and when these marks register, the hole has been drilled to sufficient depth.

It is decided the ring is of sufficient width to permit of two simultaneous shots being made. The adjacent plug is removed so the other hole can be drilled also.

While these holes are being drilled in the ring, the clamps are being attached to the Cardox shells. Their position is determined by the length of the shell guide plus the previously determined distance from the top of the coupling to the hole depth. See Figs. 3, 5, 5-A.

Short lengths (about 3 ft.) of electric exploder wire are attached to the terminals of the Cardox shells and the exploder circuit is tested with a small portable galvanometer. This practice reveals the condition of the electrical exploder circuit. If the exploder circuit tests faulty or open, no attempt should be made to use such a shell or cartridge.

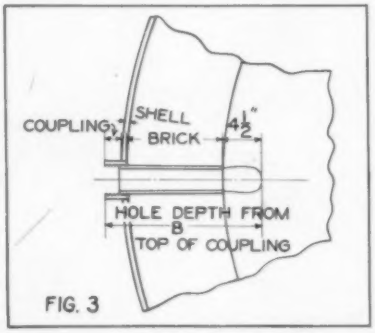
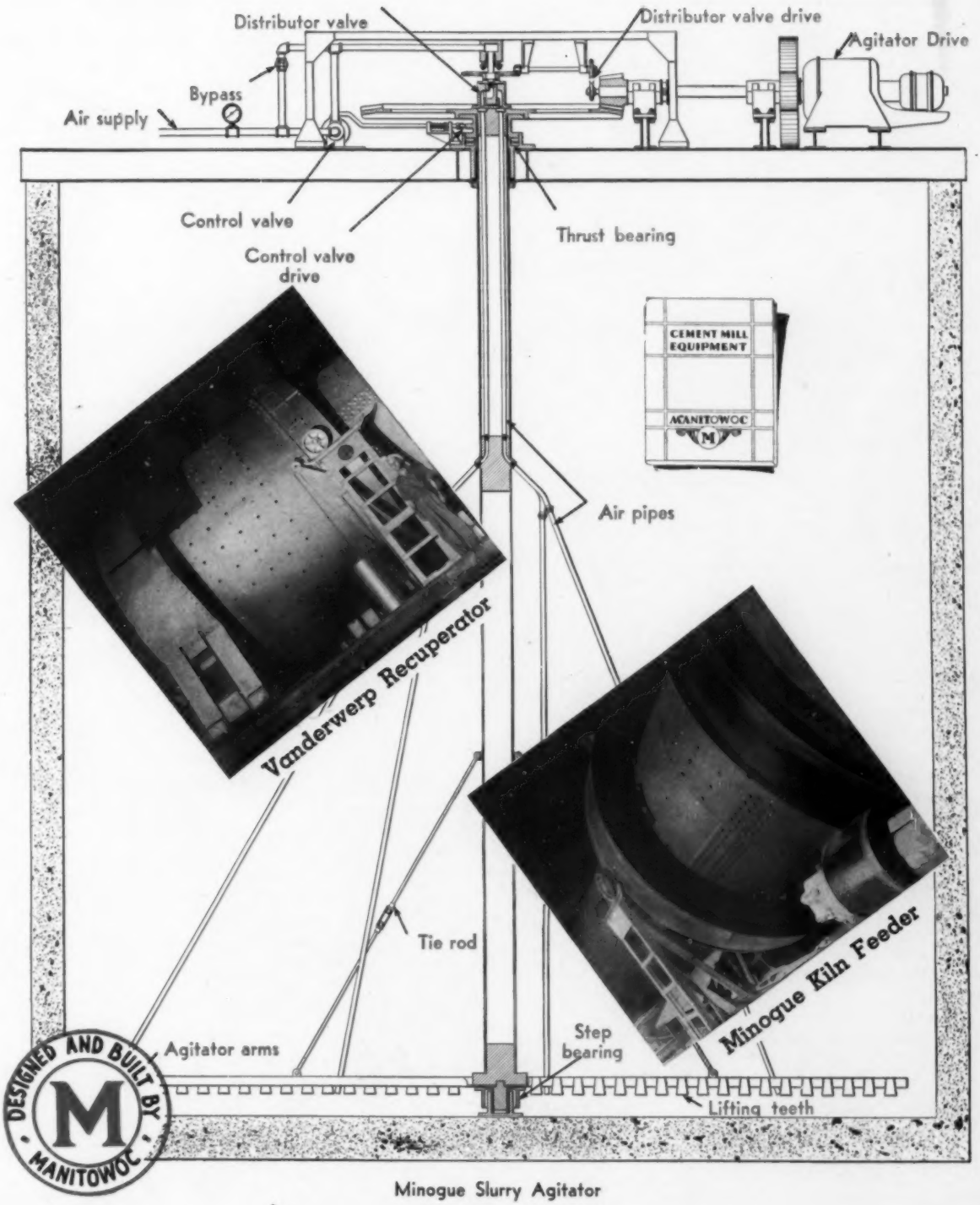


Fig. 3: Depth of drilled hole for blasting ring in rotary kiln



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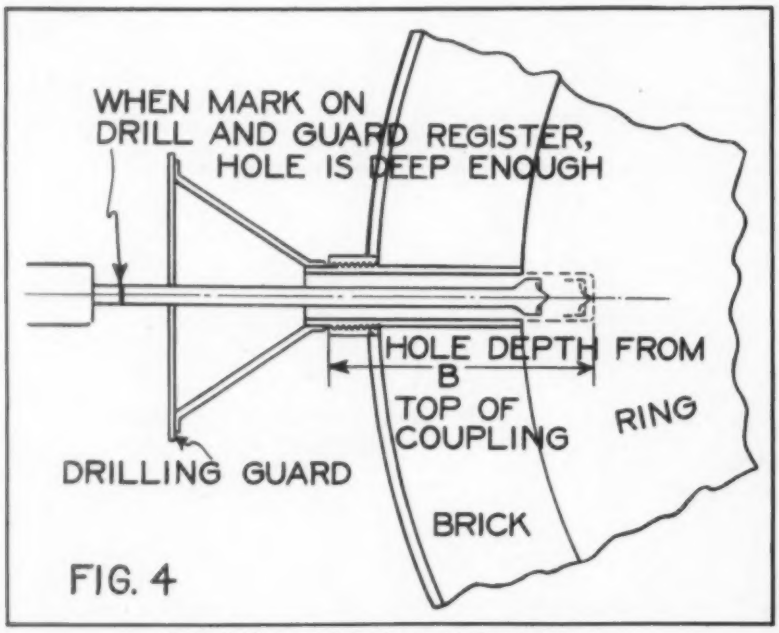

Fig. 4: Drilling guard used when drilling hole in ring

Both holes now have been drilled into the ring to the proper depth. Both are solid, that is, they didn't break through. And is that ring hard!

The shell or cartridge guides are screwed into position. The shells, electrically satisfactory and with clamps in their proper position, are inserted and the yokes pushed into place. Then the electrical connections are made so as to fire the two shells simultaneously by connecting them in series. The last connection to be made is to the source of electrical energy, be it battery, generator or light circuit.

The kiln now is turned to put the shells directly underneath. All spectators are sho-o-o-d away from the direct site of the blast. Peering from behind brick piles and other points of personal coverage, and with bated breath, we await the coming explosion.

With a quick push the handle of the exploder battery is driven down. A muffled roar is heard and the reverberation brings down the dust accumulated on the roof-truss members and purlines.

There is a rush to the burner's platform to see what the results have been.

The kiln is turned so the now exploded shells are above the load in the kiln. The wires are removed, yokes pulled off and the spent shells extracted. Pieces of brick are driven into the ports and the plugs screwed into place.

What a sight greets the onlooker as he observes the effects of the blast on the refractory, recalcitrant ring. It has been given a mortal wound. As the kiln turns, large chunks are seen tumbling about in the load. A big gap is seen in the ring and pieces continue to fall out as the fire is put on and the kiln continues to turn.

We look at our watches. Forty-five minutes have elapsed from start to finish. We can believe the job will require only ten or fifteen minutes when the men get more experience.

Pavement Yardage

AWARDS of concrete pavement for June, 1943, have been announced by the Portland Cement Association as follows:

Awarded During June, 1943

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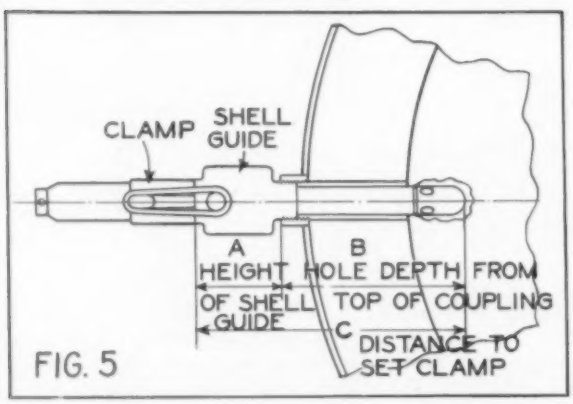
Roads	1,103,801
Streets and Alleys	597,414
Airports	6,325,402
Total	8,026,617

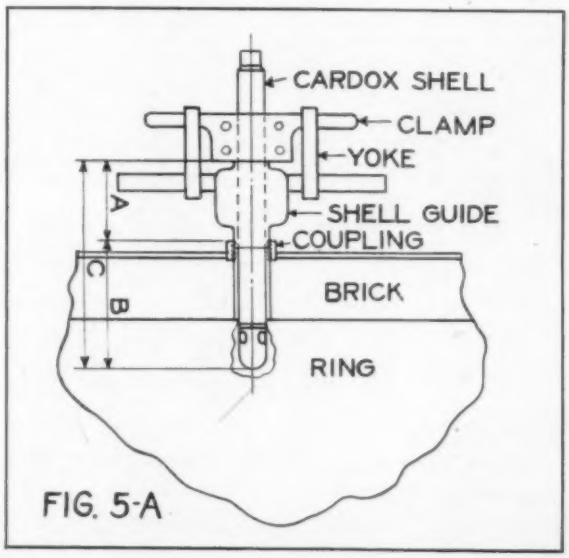
Cyanite Ore Important

YANCEY CYANITE CO., Burnsville, N. C., is operating 24 hours a day, six days a week, for cyanite used in making refractories. When construction is completed, the plant will treat 500 tons of ore a day.

Fig. 5-A, right: Completed set-up ready for the blasting operation

Fig. 5, below: Showing how blasting charge is prepared for removal of kiln ring





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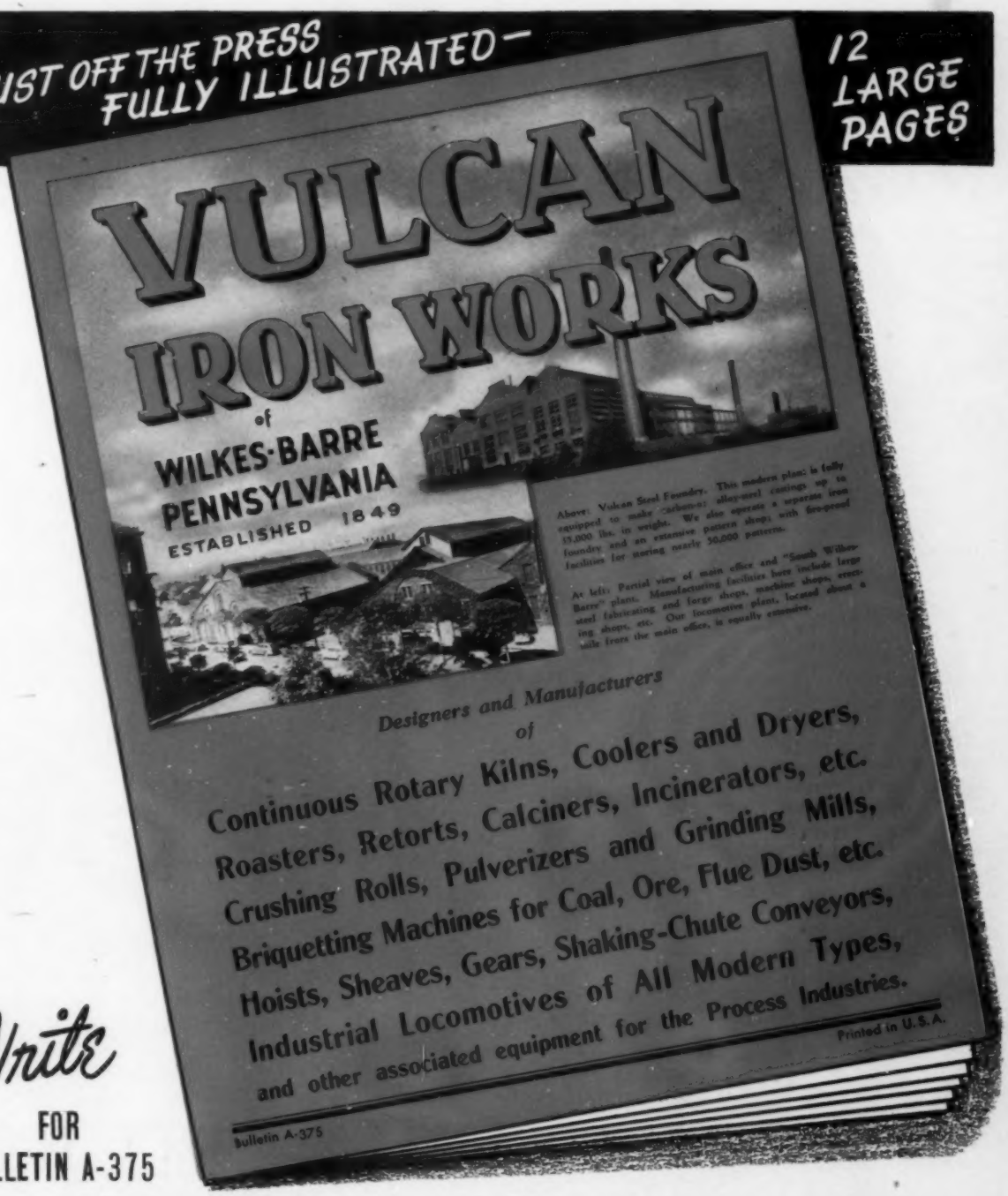
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At left: Partial view of main office and "South Wilkes-Barre" plant. Manufacturing facilities here include large steel fabricating and forge shops, machine shops, erecting shops, etc. Our locomotive plant, located about a mile from the main office, is equally extensive.
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ELECTRONICS

Maintenance-Trouble Shooting Tips

Increasing use of electronic control equipment in rock products industry emphasizes need for better maintenance practices

By W. D. COCKRELL*

ELECTRONIC CONTROL DEVICES — ranging from specialized resistance welding controls used in metal-working industries to standard photoelectric relays (electric eyes) used for hundreds of jobs in all industries—are being worked hard in today's production battle. Electronic equipment, generally, requires less maintenance than other electric equipment since it has no moving or wearing parts.

Most of the components of electronic controls — resistors, reactors, transformers, and capacitors—are of a semi-permanent nature and are conservatively rated to give many years of service with very little maintenance. Even the electron tubes themselves, while replaceable, require inspection and test only at comparatively long intervals.

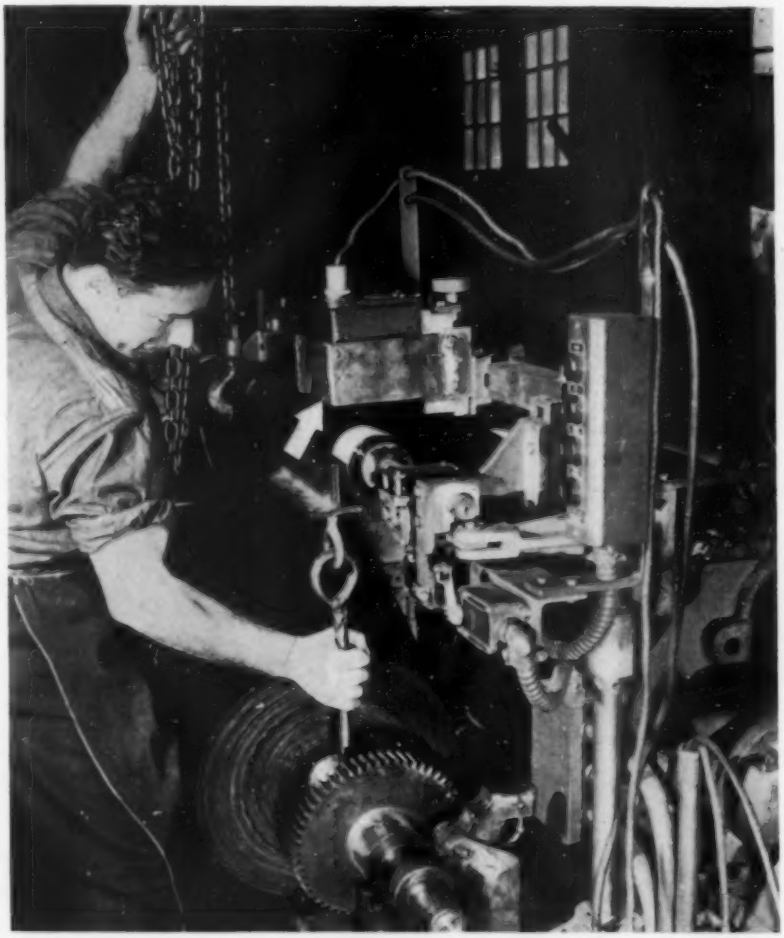
In view of these facts and the fact that electronic control sometimes will continue to function under extreme conditions of moisture, temperature, and dirt, there is frequently a tendency to neglect the simple rules of good maintenance.

First, it must be remembered that many parts of electronic controls are similar to those used in magnetic controls. Enclosing cases, bases, terminals, and wiring and conduit devices are frequently identical. Standard magnetic control devices—such as fuses, switches, and overload relays of both the instantaneous and the time-delay types—are found on many electronic panels. These devices usually perform starting or protective functions and operate infrequently. As in the case of standard magnetic control panels, this infrequent operation itself sometimes results in special maintenance problems. Detailed instructions as to the inspection and maintenance of these standard devices may be found in maintenance manuals covering this equipment.

Particular emphasis should be placed on inspection for *cleanliness* and the *effects of vibration*. Because of the high impedances used in some electronic circuits, an excessive accumulation of dust or processed material will, particularly when damp, provide parasite circuits which may interfere with proper operation. Lenses and other parts of optical systems should be wiped off frequently with a clean, soft rag.

Preventive Maintenance

Since many electronic panels are interconnected extensively with other apparatus, the loosening of connec-



Photoelectric scanning heads should be protected against being struck by workmen. Note arrow pointing to head

*Engineer, Electronics Section, Industrial Control Division, General Electric Company.

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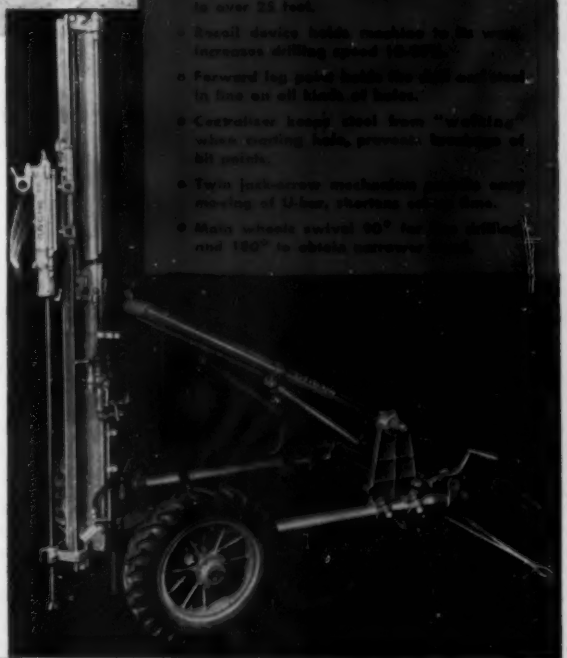

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tions or the breakage of leads through the effects of vibration may cause serious shutdowns, entailing intensive (and sometimes aggravating) "trouble shooting" before the fault is located. Vibration also tends to shorten tube life. If severe vibration is found to exist at the installation location, shock mounting of the control panels, as well as the use of stranded or extraflexible leads, may be justified.

Photoelectric and other electronic controls involving mechanical components should be checked frequently to assure that the mechanical adjustments have not been disturbed. Common causes of such disturbances are bolts loosening under vibration or chain hoists and other shop equipment hitting against the equipment.

Very rarely does a modern electronic tube fail suddenly. Usually the failure is the result of a gradual loss of emission that takes place as the active cathode material is used up or flakes off. Overloading, mechanical abuse, operation at high or low filament or cathode heater voltage, and operation outside of required temperature limits all tend to shorten tube life.

Among the most prevalent causes of poor operation and short tube life are the operation of electronic panels on line voltages differing too greatly from the panel nameplate voltage, and the use of the wrong tap when a tapped-input transformer is provided. Panels are usually designed to operate satisfactorily on line voltages varying plus or minus five percent of the panel rating. If the voltage at the installation point is consistently high or low, a small auto- or booster-transformer may be used. If the line voltage fluctuates widely, a special voltage-regulating transformer may be required. Faulty heater transformers, loose connections, and corroded socket connections also may limit the low-voltage, high-current power required for the tube cathode heater.

High-vacuum tubes and tubes filled with true gasses, such as argon and xenon, may be operated without difficulty over a wide ambient temperature range, but tubes using mercury vapor operate best in a more restricted ambient range. Enclosing case ventilation and other temperature-regulating means are provided for the usual industrial indoor ambient temperatures of 60 to 100 deg. F. For low ambient temperatures, manually or thermostatically controlled strip heaters may be mounted in the case. For temperatures from 100 to 120 deg. F., fan or forced-air cooling may be sufficient. Above this temperature, components other than the tubes may be affected also and it may be that standard equipment will be unsuitable for the installation.

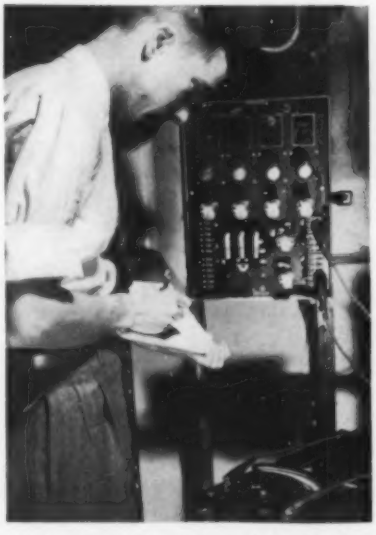
Panels which use gas- or mercury-filled tubes are normally equipped with a cathode protective timer. This timer should be set for the heating period designated by the instructions accompanying each new tube. This time has been found by experience to be the minimum time permissible for reasonable tube life and must not be decreased for any reason.

During the shipment or handling of mercury-vapor-type tubes, the liquid mercury may be splashed on the elements. Therefore, when the tube is first placed in service, it is necessary to heat the tube cathode for a time with the anode lead disconnected, distilling off the splashed mercury before the anode power is applied. This requires a longer period than the usual cathode heating time; the tube instructions give the proper time.

Some electronic panels are designed to use tubes on external loads. It is essential that these loads not be greater than either the average or peak rating of the tubes. Sometimes an operator will increase the anode voltage, replace coils, or alter motor pulleys or gearing to obtain a greater output, thus overloading the tubes. Since they seriously reduce tube life, such practices should be avoided.

The effects of vibration on tube life have already been considered but shocks and jars in handling tubes, particularly when they are old, can be quite detrimental. Sharp shocks, such as caused by dropping or striking the tube, if they do not actually rupture the envelope, may jar the elements out of position or even break welds or leads.

Mercury-vapor tubes must be kept upright as much as possible to keep the mercury off the elements.



Electronic control equipment being checked for line voltage, which should correspond to panel nameplate rating, or within variation of plus or minus 5% of marked value

Checking control panel to see that screws and bolts are tight

Trouble-Shooting

The best trouble-shooting tool is a clear knowledge of the operation of the panel and each part of it. If partial operation is obtained but other actions fail to occur, the trouble may be isolated to a part of the circuit.

Since many circuits on electronic panels have a very high impedance, meters having high impedances are very desirable in servicing the equipment. A useful tool is the radio service multimeter which has a resistance of 1000 ohms per volt or higher. For some circuits, however, an electronic meter, such as a vacuum-tube voltmeter of the d.-c. reading type or a cathode-ray oscilloscope, is essential. The cathode-ray oscilloscope, particularly when modified to read direct-current potentials, is an extremely useful device since it combines a very high impedance voltmeter with a time axis, thus making visible voltage changes much too rapid for the ordinary meter to follow. Instantaneous thyratron grid and plate potentials and other voltage waveforms may be observed easily on the oscilloscope and any

(Continued on page 124)

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Start Universal's Northampton Plant

OPERATIONS have been started in the new cement plant of the Universal Atlas Cement Co., at Northampton, Penn., according to announcement by Blaine S. Smith, president of the company. A description of this plant appeared in ROCK PRODUCTS, December, 1942, pp. 65-67.

The new plant is said to be one of the finest and most modern in the world. It is capable of making all types of cement including white cement. It generates its own power by utilizing waste heat from the kilns to operate steam turbo-generators. The new plant also utilizes the flotation system.

Northampton, from which 8,000,000 bbl. of Atlas cement were shipped for the Panama Canal, is historic in cement annals. The new plant is the fifth to be built on the same properties, each in its time a model of the latest developments for cement manufacture. Northampton plants of Universal Atlas are identified with the origin of some of the most important steps in the making of portland cement now used throughout the industry, including the first rotary kiln in America, the introduction of powdered coal, and the discovery of the retarding influence of gypsum in the setting time of cement. Here also, the company made one of the first white cements and originated the American production of calcium-aluminate cement.

The new plant was designed by the engineering department of the company under the directon of P. C. Van Zandt, consulting engineer, and S. J. Robison, chief engineer. M. W. Winsch is plant manager. Turner Construction Company, New York, were general contractors.

Blasting Studies

Bureau of Mines recently completed an investigation of the characteristics and destructiveness of air blasts caused by the detonation of high explosives. The information will be particularly applicable in designing government and other buildings to withstand the air blast or concussion from bombs and give occupants maximum protection should air raids occur, and in minimizing damage from blasting in rapidly expanding quarry and mine operations.

The second and concluding report on "Damage from Air Blast," prepared by Bureau scientists, the new publication presents the results of extended technical field tests conducted last year, including measurements of pressures produced in quarry blasting, measurements of high pressures from experimental shots, and observations on structural failures, particularly that of window glass.

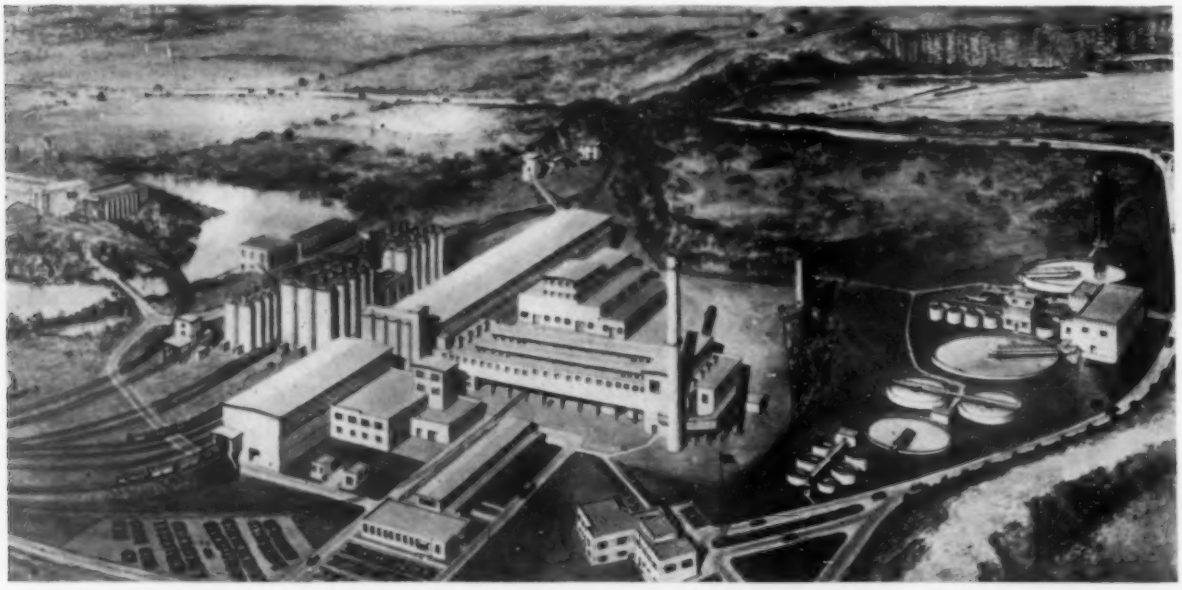
From quarry tests in which various types of shots were studied, it was concluded that the problem of damage from air blast is insignificant under normal operating conditions for the pressures created in blasting were insufficient to break window glass at distances just beyond the range of flying rock. Doubling the weight of a charge of dynamite fired in the open air increased the maximum pressure by approximately 50 percent; orientation of the dynamite had no effect upon the pressure wave; standard nitroglycerine dynamite produced higher pressures than commercial gelatine dynamite of the same weight; window glasses were shattered before any other structural failure was noted but fragments were not thrown far into the room; and pressures reflected or "bounced" from the ground and building and quarry walls influenced measurements and must be considered in any pressure investigation. Report of investigations No. 3708 by S. L. Windes, associate physicist, may be obtained by writing to the Bureau of Mines, Department of the Interior, Washington, D. C.

Lake Sand for Glass

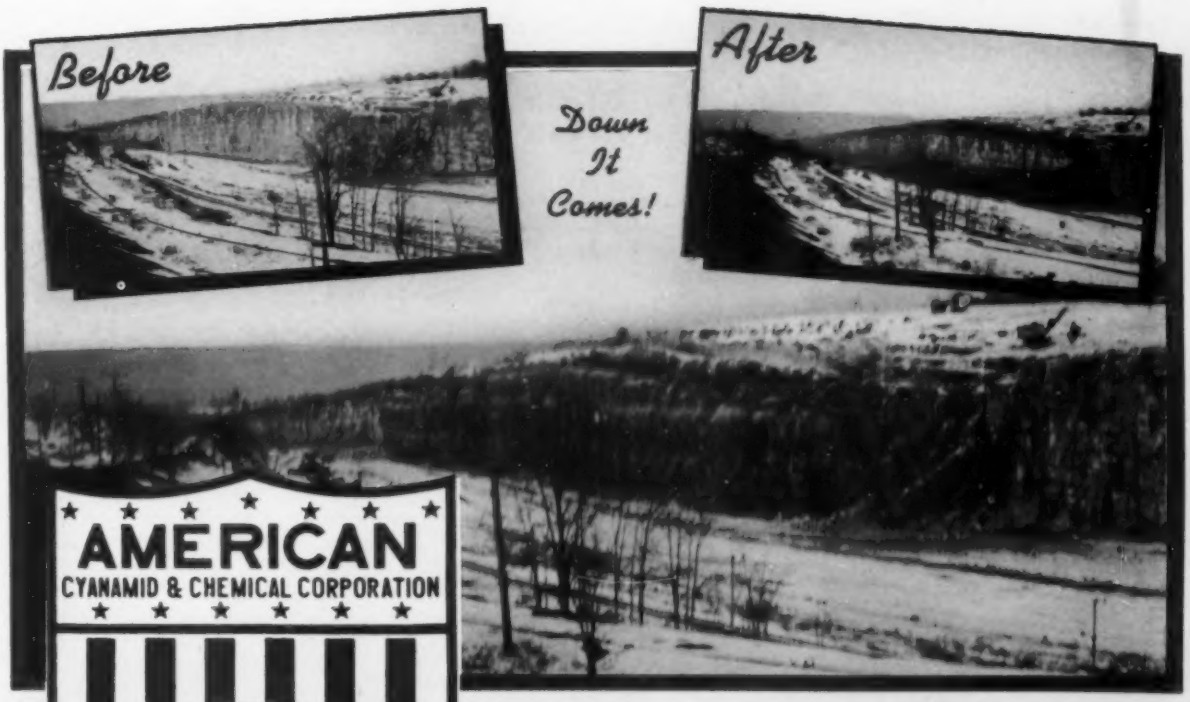
MORE than 4,000,000 lb. of lake sand is used each week by Libby-Owens-Ford Glass Co., Toledo, Ohio, for grinding and polishing plate glass.

Synthetic Rubber Sponge

B. F. GOODRICH Co., Akron, Ohio, has developed a synthetic rubber sponge which it is said will stay soft and compressible at 40 deg. F. below zero. It is made in black color and can be furnished in slabs or molded shapes.



Airplane view of the new wet process cement plant at Northampton, Penn.



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Automatic Control Cuts Fuel Costs

Propose coordinated control system for operating rotary kilns to maintain a predetermined production rate

INCREASING FUEL COSTS have made it imperative for all cement companies to take advantage of every means to cut corners. Automatic burning control for rotary kilns has proved invaluable in securing maximum firing efficiency. It is evident throughout the entire cement industry and particularly in the Lehigh valley that cement companies realize the importance of adequate burning control equipment as a number of plants have equipped at least one kiln to study the possibilities of various instruments. The P.C.A. also has started research studies covering automatic burning control.

The whole question of burning control, however, is still unsettled if the feed to the kiln is not uniform. A spot check taken every hour may show very little variation in the feed, but one cement company discovered some surprising changes in the rate of feed when check samples were taken every five minutes.

An excellent paper reviewing the progress in automatic burning control was presented before a joint meeting of the Fuels Division of The American Society of Mechanical Engineers and the Coal Division of the American Institute of Mining and Metallurgical Engineers, by Prof. William E. Reaser of Lafayette College. A complete review of this paper will not be given as part of this information appeared in ROCK PRODUCTS, January, 1939, pp. 51-53 and August, 1939, pp. 43-45.

As pointed out by Prof. Reaser, the burning operation is one of the most important and most expensive processes in the sequence of cement production, especially when waste-heat steam generators are used. Another important factor in kiln operating cost is refractory maintenance. Records of plants using automatic control show savings ranging from 5 to 10 percent of the fuel expense alone and, in addition, considerably lengthened life of refractories due to elimination of extreme temperature fluctuations in the burning zone. It is practically impossible to hold maximum clinker temperatures within limits of plus or minus 25 deg. F. and to maintain kiln speeds at uniform rates without stoppages for "heating up" without the use of automatic instrument control. These restrictions are now imposed on many producers.

In the two articles in ROCK PRODUCTS, previously referred to, schematic layouts for kiln control showed applications where secondary air was supplied under induced draft, where secondary air was supplied under forced draft, and where the kiln was equipped with two-point temperature control as a means of automatically maintaining desired fuel-flow, air-flow relation.

Coördinated Control System

Prof. Reaser has proposed a new scheme which he terms a coördinated control system for the automatic operation of rotary kilns. Clinker burning in this system is controlled to maintain a predetermined production rate. It involves the preservation of a fixed speed of kiln and modification of the air and fuel supply to secure the desired burning temperatures. The diagram shows the arrangement of equipment and controls.

The raw mixture is supplied to the kiln by a suitable feeding device. As the kiln rotates, the material passes down the kiln through the burning zone to be discharged as clinker to the perforated shaking grate of a pressure-type cooler. Air for cooling the hot particles is provided by a forced-draft fan. The air-quenched clinker passes from the cooler to the atmosphere through a swinging gate, or if further cooling is necessary, an aftercooler may be employed. In this event, an additional fan might be used to supply the air, or one fan of greater capacity could be arranged to discharge into a divided duct. Fuel is prepared in a unit air-swept pulverizer. A portion of the air which cooled the clinker is drawn away from the cooler by the primary-air fan to dry the coal and transport it in suspension to the kiln. The remainder of the air passing through the clinker bed enters the hood to complete combustion of the fuel.

By trial, the optimum kiln speed is determined. Thereafter, it will remain constant, unless there is a pronounced change in the character of the raw mixture or in the type of product desired. At the same time, the optimum speed of the raw feeder is experimentally established and will remain fixed unless an emergency arises. As an ideal, an adequate system should maintain the proper heat release to produce specified clinker temperatures. It should also maintain optimum combustion efficiency by holding the air-fuel ratio continuously at the value which gives the best over-all economy.

How System Functions

To understand how the coördinated kiln-control system functions, it is important first to examine the method of regulating fuel flow to the kiln. With an air-swept coal pulverizer, the

(Continued on page 118)

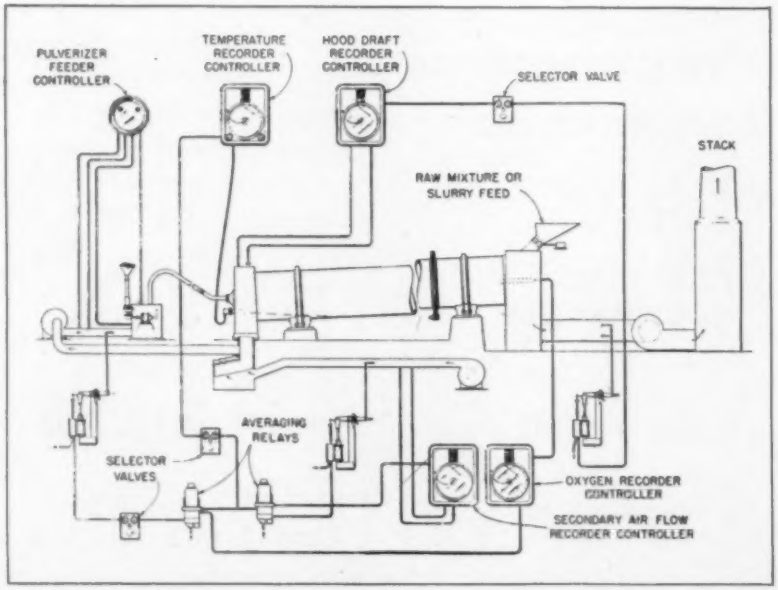

Diagram showing coördinated control system for automatic operation of rotary kiln

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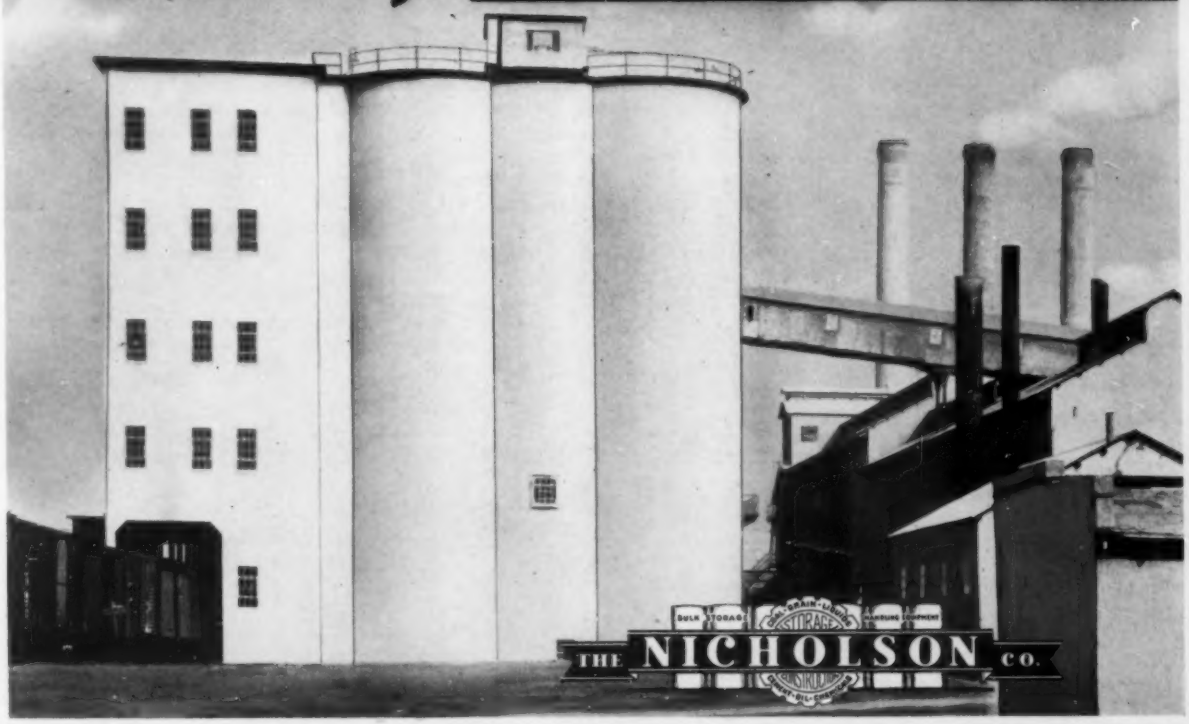

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Permanente Process of

Making Magnesium from Magnesite*

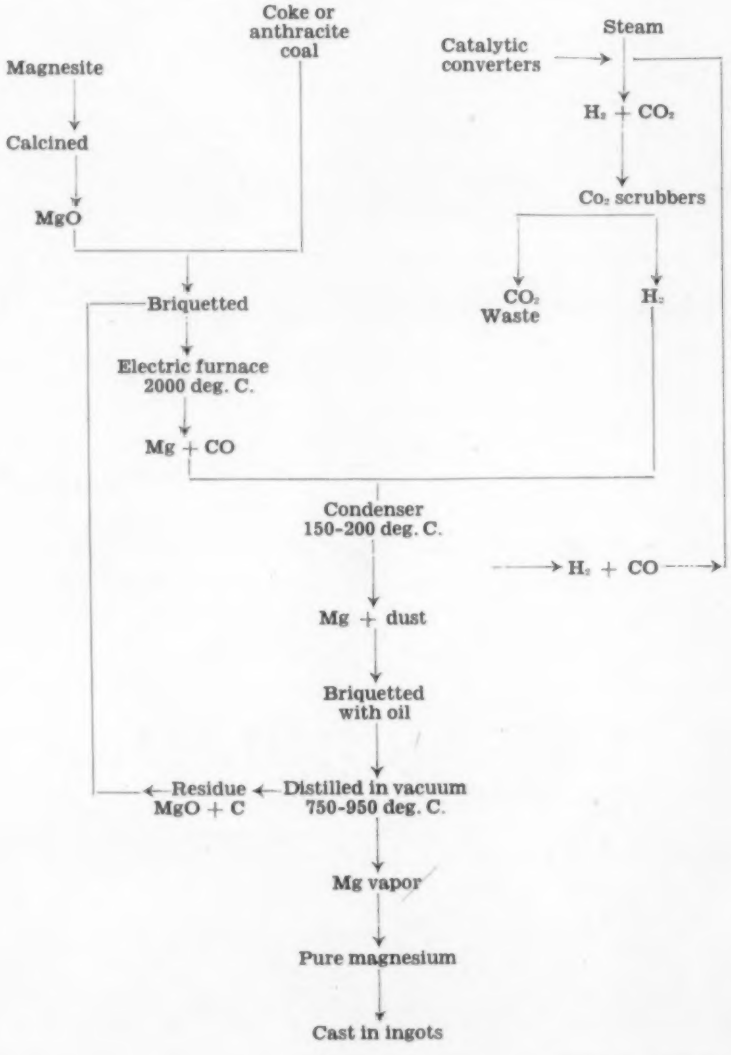
PRODUCTION of magnesium from magnesite by the Hansgirg process has been under way for over a year in the first unit of the new plant of the Permanente Corp. near San José, Calif. The operation is being watched with keen interest as a source of cheap magnesium. Rumors of troubles previously encountered with this process have gained wide currency. Conditions abroad and censorship of information from warring countries have prevented checking these rumors with those who know the facts in Germany, Wales, and Japan.

The basic idea of the Hansgirg process is to reduce magnesium oxide with carbon at a high temperature, dilute and cool the reaction products with a cold inert gas, and thus recover metallic magnesium. The reversible reaction ($MgO + C = Mg + CO$) is forced to the right by the high temperature (2000 deg. C.) of a three-phase electric arc furnace. If the reaction products are cooled normally, the reverse reaction occurs and the yield of metallic magnesium is negligible. Sudden chilling and dilution of the Mg-CO mixture minimizes the reaction between the two and gives a high yield of metal. The original process employed cold hydrogen introduced directly into the gas stream from the furnace to dilute and cool the mixture suddenly to 150 to 200 deg. C. Approximately 50 volumes of hydrogen were used per volume of magnesium vapor. Under these circumstances metallic magnesium is precipitated as a dust containing some magnesium oxide and some carbon carried over from the furnace. The dust is briquetted with oil, distilled at 750 to 950 deg. C. *in vacuo* and the metal condensed and collected as powder under a hydrocarbon oil. The metallic powder is then melted and cast into ingots. The residue from the still ($MgO + C$) is returned to the process. The mixture of hydrogen and carbon monoxide from the condensers is treated with steam in the presence of a catalyst to convert CO to CO_2, which is scrubbed out, and the hydrogen is returned to the process.

This is substantially the process as it was developed by Hansgirg of the Austro-American Magnesite Co. and operated at Radenthein, Austria, some years ago. The magnesite used was of the highest purity consistent with reasonable cost. The hydrogen must be low in carbon monoxide and free from carbon dioxide and water vapor. The quantity of hydrogen in circulation in the process is large, but the amount required once the process is started is merely the make-up of mechanical losses (about 4 cu. ft. per lb. of metal. At Radenthein, the electric furnaces used were 800-kilovolt ampere capacity, three-phase arc furnaces. The plant and process were described in some detail by Landis[1]. Subsequent installations of the process with modifications are reported to have been made in Germany, in Wales, and in Chosen, but for obvious reasons, details cannot now be obtained.

(Continued on page 117)

FLOW DIAGRAM OF THE HANSGIRG MAGNESIUM PROCESS



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Cement or Aggregates?

Disintegration of Concrete by chemical processes studied by A.S.T.M. committees

MOST SIGNIFICANT of the many papers, committee reports and discussions at the recent annual meeting of the American Society for Testing Materials at Pittsburgh, Penn., were those dealing with the effect of alkalies on concrete durability. It was obvious that two schools of theorists are developing: (1) Those who blame the alkalies in portland cement; (2) those who blame certain ingredients in the aggregates. Both factors are unquestionably involved, but beyond that fact much remains to be found out.

One whole session was devoted to an open meeting of the working subcommittee of Committee C-1 on cement, for the discussion on alkalies in cement and their effect on certain types of aggregates. R. F. BLANKS, materials and testing engineer, U. S. Bureau of Reclamation, Denver, Colo., led off the discussion with some "horrible examples" of disintegrated concrete in dams in the far west. He stated, in his apendix to the report of Committee C-1, "that the list of important concrete structures so affected continues to grow"; and that "in all cases the deleterious effects of adverse chemical reactions between high-alkali cements and aggregates have been established beyond any reasonable doubt."

The nature of the chemical reactions, at present, appears very obscure. Apparently it depends on some active form of silica in the aggregate, which combines with the soda, potash and lime in the cement, producing hydrous gelatinous compounds. These cause expansion and loss of bond in the concrete. Such kinds of aggregates, pulverized, are the same ones sought for as puzzuolanas in the manufacture of hydraulic limes and puzzuolana cements. And one curious feature in connection with investigations of "high alkali" cements is that when these materials are used as puzzuolanas, or admixtures, with these portland cements, they appear to reduce or prohibit the reactions which cause expansion of the concrete. It is only when they are used as *coarse* aggregate that they cause trouble.

Those aggregate materials that are known to be "bad actors" contain the opaline form of silica; other highly siliceous rocks (such as some cherts, some siliceous limestones, some chalcedonies, and intimate opal-chalcedony admixtures), certain acid to intermediate volcanic rocks, miscellaneous types of siliceous rocks. In general, minerals containing glassy ingredients are reactive, except volcanic glasses of basic composition. Basic rocks, like the limestones, in general give no reactions.

Considers Low Alkali Cements Justified

In conclusion, Mr. Blanks said: "Engineers are perennially confronted by the necessity of choosing aggregates and cements for current projects, and in spite of all the development of data which has resulted from field and laboratory studies, concrete engineers are nevertheless still inadequately armed for the task of making sound judgments with respect to these selections. The difficulties involved in making these practical day-to-day decisions resolve themselves into a few general categories. First, there is lacking a quick and positive test for potential reactivity of any given aggregate, and no rapid and certain method is available for evaluating in advance of use the relative compatibilities of specific cement-aggregate combinations. Second, the list of reactive aggregate materials embraces so many rock and mineral types that it is impracticable to reject materials which resemble others with known reactive histories. Third, very small amounts of known reactive substances appear in a large number of reactive aggregates, but we do not now know what is a tolerable limit of such substances below which amount they can be ignored and above which they must be reckoned with. Fourth, satisfactory uses of ameliorative admixtures or other preventive procedures, which might be applied in cases of doubt, have not been developed, although a promising approach may be through the use of puzzuolana cements. In short, from the standpoint of practical working procedures, we are not far advanced beyond our position of 1940, when the Bureau of Reclamation, the California Division of Highways, and a few other agencies took refuge in the specifications of comparatively low-alkali cements for all major construction. Fortunately, the efficacy of thus specifying a limit for the alkali content has been proved.

"Although it is clear that still lower alkali contents than heretofore specified would accomplish an additional improvement, and although laboratory experiments have indicated that, even with relatively low-alkali cements, certain fortuitous combinations can produce expansions, it is nevertheless true that in respect to structures in service, the reduction of alkali content of cements has resulted in definite retardation, quantitative reduction, or complete elimination of the typical expansive deteriorations. In all instances in which the same reactive aggregates have been used with both high- and low-alkali cements, the structures or parts of structures in which low-alkali cements were used, exhibited no expansion, or at least much less expansions than where high-alkali cements were used. Only time will tell whether in specific cases the results of using low-alkali cement have been retardation of rate, reduction in amount, or complete elimination of the expansive reactions. But, in any case, the policy of specifying an upper limit on alkalies has been fully justified by service experience and laboratory tests; and that policy today remains the only practical working procedure of general applicability."

Possible Role of Lime

W. C. HANNA, chief chemist, California Portland Cement Co., also stated that it is the puzzuolanic aggregates that cause trouble. He emphasized "that any aggregate which will react in saturated lime water will certainly prove to be reactive in concrete, regardless of the alkali content of the cement used. [This is the recognized test for a puzzuolanic material—Editor.] He said he was of the opinion "that the calcium hydroxide freed by water from any cement in any concrete must have an effect on the concrete, and that the amount of the other compounds of sodium, potassium, ithium, etc., will also have an effect." He also pointed out that the reaction

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Cement or Aggregates?

(Continued from page 112)

between the aggregates and the cement may have a beneficial effect, especially when the aggregate is in finely divided form. Mr. Hanna's own laboratory work proves quite conclusively that no portland cement is immune for any known reason, since both high- and low-alkali cements showed about the same expansion at later ages, in the great majority of instances.

BAILEY TREMPER, materials engineer, State of Washington Department of Highways, called attention to the possible relationship of failures in concrete from freezing and thawing and the use of reactive aggregates and high-alkali cements. He concluded: "That regardless of the exact cause of deterioration, observation of existing concrete structures in Washington makes the conclusion inescapable that over 90 percent of the cases of unsatisfactory durability are those in which the cement was known, or strongly suspected, to have been high in alkali."

CHARLES E. WUERPEL, engineer-in-charge, Central Concrete Laboratory, U. S. Army Corps of Engineers, offered a scholarly discussion, more in the nature of an inquiry than a theory. He said: "There can be no doubt that certain aggregate types react to a variable degree with cement hydrate, and that other aggregate types are metamorphosed in an environment of a cement hydrate, but no evidence has been observed that would indicate that such reactions were the direct cause of concrete failure [in his part of the country—the Northeast]. To the contrary some reactions of this nature might be beneficial in strengthening the bond between the aggregate particle and its surrounding medium. Opaline silica, and perhaps, to a lesser degree certain volcanic glasses appear to be the exceptions. The detrimental effects of their presence can not now be questioned."

Mr. Wuerpel, quite properly, in our opinion, attributes the reactions to ordinary colloidal chemistry. He suggests: "The gain in strength of hydrating portland cement is taken to be due largely to the hardening of the hydrous calcium silicate gels formed by the reaction between the water and the compounds in the cement. The hypothesis is presented that the hardening process of the cement gels may be disrupted and thrown out of balance when invaded by foreign sols from the aggregate. Localized acceleration or retardation of coalescence may develop, causing internal stresses which slowly result in concrete failure as the amorphous substances become less and less elastic. Or, the molecular balance of hydrous calcium silicate may be upset, causing additional molecules of water to combine with the calcium silicate resulting in a residual expansion in volume of the hydrated or hydrating product.

"Colloidal silica, such as that derived from the disintegration of opal, readily adsorbs any available sodium ions, the presence of which greatly reduces the tendency of the colloidal particles to coalesce. At first, this condition will be localized close to the particle of opaline silica. Limited amounts of the silica from the opal may combine with the siliceous hydrates of the cement, but other portions may slowly migrate through the ground mass of the concrete, adsorbing other available ions and influencing the coagulation of the areas of cement hydrate through which they pass. As a colloidal solution, silica will diffuse through animal, collodion, or parchment paper membranes, sufficiently fine in texture to retain colloidal silver . . . under reduced pressure, it becomes unstable and finally undergoes a change in which viscosity rises rapidly, and the entire mass sets to a solid gel. Just how the influence of this variable in impure silica sols may affect the normal hydrous calcium silicate gels of portland cement is a problem in colloid chemistry, and it is believed that a study of this field must be made before a complete explanation of the expanding and cracking phenomena observed in certain western concrete structures can be made and the effects remedied.

"There remains much to be learned of the chemistry and physics of portland cement and of the minerals in aggregates which may react with the hydrated products of portland cement. It may be that the policy of specifying a nominal upper limit on alkalies is justified when aggregate known to possess opaline silica must be used, but the indications that even lower quantities of alkali in cement may, in combination with certain aggregates, cause very considerable expansion in concrete at later ages makes such a policy a tenuous stopgap. If the alkali content of portland cement must be reduced, means for such reduction must be perfected by the manufacturers in such a way that the other properties of the cement will not be affected adversely. A prematurely adopted limitation on the alkalies might cause an undesirable influence in the manufacture of portland cement."

Most of the other discussion had to do with the inadequacy of tests to determine in advance what might be expected of various combinations of cements and aggregates.

Effect of Air-Entraining Admixture with "Bad Aggregates"

Since it has generally been accepted by highway engineers that "air-entraining admixtures," such as vinsol resin, improved the resistance of concrete to freezing and thawing, the Missouri State Highway Department carried on laboratory experiments to see whether or not the use of such admixtures would help in the case of "bad actors" among the aggregates. The results of these experiments were reported by E. O. AXON, T. F. WILLIS and F. V. REGAL (engineer of materials). Four typical coarse aggregates were used, two limestones and two chert gravels.

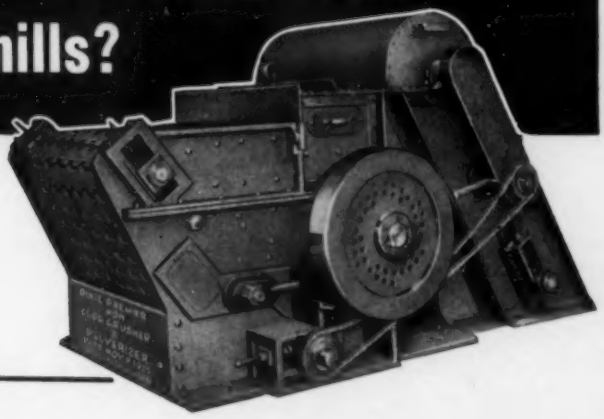
Without going into detail as to test procedures, which would be necessary to explain some of the conclusions drawn from these tests, the following is the most to the point for those seeking a way to make "bad actors" among aggregates good: "In the present stage of development of laboratory freezing and thawing tests, the information obtained from these tests can only be considered as indications: (1) Vinsol resin as an air-entrapping admixture caused no appreciable improvement in durability of concrete containing chert gravel of such characteristics that its use in pavement concrete has resulted in pavements of poor quality. (2) In the case of chert gravel of such characteristics that its use in concrete has resulted in a fair service record, there is disagreement between the indications of the two test procedures, which raises the question of the validity of the results of either or both procedures."

Concluding, the authors said: "In our opinion there is only a slight chance that vinsol resin will benefit pavement concrete containing aggregates of this kind, but this chance and also the possibility that increasing the initial flexural strength will produce concurrent benefits, should be investigated. The entrapment of air improved the durability of concretes containing either limestone. In the case of the limestone which has an excellent service record in concrete pavements, this may be somewhat akin to 'guilding the lily'."

Since the various researches and

(Continued on page 116)

Mr. Cement Man, Do You Know All You Should Know About Hammermills?



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*Quoted excerpts are from the article "Producing Cement in Cuba" by W. Forster and A. Lopez Gomez in *Excavating Engineer*.

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Cement or Aggregates

(Continued from page 114)

reports of experience now involve the responsibility of the aggregates quite as much as that of the cement, the subcommittee VI on relation of characteristics of materials and mixtures to the properties of concrete, of Committee C-9 on Concrete and Concrete Aggregates, is going to take a more active part in developments.

Non-Uniform Cements

Periodically portland cement manufacturers are reminded that "standard" portland cement is not a uniform product. The latest is a paper by S. P. WING and ARTHUR RUETTGERS, engineers, U. S. Bureau of Reclamation. The discussion that developed seemed to question how much of the differences exposed in 28-day strength tests was caused by actual differences in the cement and/or the manipulation in the preparation of the test specimens. The tests were made in connection with the purchase of cement for two dams in the Northwest by the National Bureau of Standards laboratory at Seattle, Wash.

The average 28-day strength of ten low-heat cements supplied to meet a minimum strength requirement of 2000 p.s.i. in mortar cubes was 3250 p.s.i. Strength levels of the cement from the various mills ranged from 2830 to 5000 p.s.i., the coefficient of variation between them being 19 percent and the total spread being 67 percent. High variations in the 28-day strength of cement from individual mills were found to be associated with high variations in specific surface area and/or tricalcium silicate content. While the differences in 28-day strengths tended to even out with age, as shown by tests of job concrete using blends of the various cements, it is obvious that the cements from different mills, and even different shipments from the same mill, had quite different early strength properties. While the 28-day tests were used for acceptance of cement they did not give much indication of the strengths of the job concrete at advanced ages.

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Gypsum Statistics for 1942

WARTIME demands for gypsum and the decline of private building construction have brought about drastic changes in the gypsum industry. Bureau of Mines reports a 24 percent slump in the production of calcined gypsum in 1942 over 1941, but the output of crude gypsum from domestic mines declined only two percent from 1941, which reflects a falling off in imports of crude from Canada due to shipping difficulties. However, there has been a strong demand for gypsum products in Far Western, Southwestern, and in some Midwestern States.

Sales volumes of most gypsum products declined markedly from 1941, but these declines were compensated in part by the strong demand for cement retarder, agricultural gypsum, wallboard and sheathing, of which sales advanced to record volumes in 1942. In addition, markets for laminated board products expanded rapidly following their introduction about the middle of the year. As a result of demands for these products, the value of total sales declined only nine percent from the record set in 1941.

Reflecting the decline of building construction, sales of plasters and related products declined from $18,052,682 in 1941 to $11,083,667 in 1942. On the other hand, prefabricated products, including lath, wallboard, sheathing board, tile, and laminated board, showed only a relatively small decline in tonnage and an increase in value, $46,681,489 in 1941 to $46,712,543 in 1942.

Magnesium from Magnesite

(Continued from page 110)

The present operation at Permanente is planned on a larger scale than any of the others. The first unit is a 9,000-kilovolt ampere furnace. As planned ultimate capacity will be 15,000 tons of magnesium per year. Condensation of the evolved magnesium vapor is to be effected by the use of large volumes of natural gas instead of hydrogen as in previous plants. Since the magnesium plant is located adjacent to the Permanente cement mill, the natural gas used for condensing will be passed, after removal of magnesium and dust, to the cement kilns for use as fuel.

This operation is being watched with the utmost interest in view of the present special importance of magnesium in national defense and of the basic cheapness of the process for recovering metal from magnesite directly. Considerable skepticism has been expressed about the success of the present venture based on reports of troubles encountered in other plants using the Hansgirg process. The difficulties have been those that might be expected from handling hydrogen and highly flammable magnesium in vapor and powder forms and are no more insurmountable than many others successfully solved in other electric furnace industries (phosphorus and calcium carbide, for example). The vacuum distillation of the magnesium powder has presented problems in heat transfer to which a number of different solutions have been proposed.

Data from reliable sources on the operation of the process at Radenthein give a power consumption of approximately 22,000 kilowatt-hours per ton of metal, a recovery of approximately 80 percent of the magnesium fed as ore in the form of ingots of high purity, and a consumption of hydrogen of about 4 cu. ft. per lb. of metal produced. On this basis the cost of magnesium by this method should be low.

Financing

The present development is a joint venture of the Permanente Corp., manufacturers of cement, and the Todd-California Shipbuilding Corp., one of the Todd shipbuilding companies. The Permanente Corp. is understood to control the Hansgirg process in the United States and to share in financing the operation. The Todd-California Shipbuilding Corp. is reported to be the responsible borrower of the major share of the funds required from the Reconstruction Finance Corporation. Arrangements were made for R.F.C. financing to the extent of $9,250,000 for the whole plant. Part of this sum was advanced for the building of the first unit of the plant, and the remainder of the loan (about two-thirds of the total was to be made available only after successful demonstration of the process in the unit.

[1] Trans. Electrochem. Soc., 72, 293 (1937).

Deny Quarry Permit

GRANITE MATERIALS CO., North Hollywood, Calif., was denied a zoning exception to establish a quarry in the Baldwin Park area near the new federal Santa Fe dam. The petition was opposed by the federal district attorney's office on the grounds that the operation of the quarry would endanger the dam.

Monolith Defense Contract

MONOLITH PORTLAND MIDWEST CO., Los Angeles, Calif., has a contract with the Defense Plant Corporation to provide facilities for a plant in Wyoming to cost about $3,900,000.

Open Limestone Deposit

HOLLY HILL LUMBER CO., Holly Hill, S. C., is planning to develop a limestone deposit in this vicinity.

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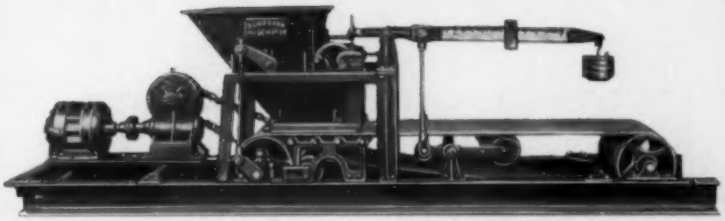

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(Continued from page 108)

quantity of fuel discharge is substantially proportional to the rate of flow of primary air through the unit, if a proportionate amount of coal is maintained therein. A controller is thus designed to vary the speed of the raw-coal-feeder motor to maintain a definite ratio of coal in the mill to the existing primary-air flow. The basis upon which this control operates is the relation between two differential pressures; one, the pressure drop across the mill proper; and the other, the pressure differential across the orifice in the air-supply line to the pulverizer. By such an arrangement it is possible to regulate the rate at which coal is delivered to the kiln by adjusting the damper which controls the flow of primary air. If an increased coal flow is demanded, the primary air is increased in proportion to the increase called for, and vice versa.

When the most desirable conditions of burning have been established by trial, the kiln and raw-feeder speeds are set. Heat release is sufficient to raise the temperature of the clinker to the desired standard. Combustion efficiency is at the optimum value, and the hood-draft controller has been adjusted to give the desired balance between forced and induced draft.

Should a change occur which decreases the temperature in the burning zone, the coördinated control apparatus, shown in the illustration, immediately functions. A photoelectric cell, sighted at the experimentally determined correct spot in the kiln, indicates that the temperature is too low, which means that the heat release is insufficient. The control operates to increase air and coal so that enough heat will be liberated to restore the temperature to the desired standard. A change in air flow is produced by a mechanism which positions the damper in the main air duct. This mechanism includes a metering device which operates through an averaging or two-element relay to establish a definite air flow rather than just a new damper position for each control impulse. Coincidental with the air increase, the same control impulse from the photoelectric cell increases fuel flow from the pulverizer. This latter action is effected by suitable means through a power drive which adjusts the damper controlling the flow of primary air to the unit mill.

Meanwhile, the exit gases are being continuously analyzed, preferably for oxygen content. A device capable of performing such a function acts as a recorder and as a controller to readjust the coal flow to maintain the optimum percentage of oxygen, since variation from such a value represents change in combustion efficiency. Impulses from this controller pass through the other averaging relay to readjust the primary-air damper.

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was used in over 30,000,000 barrels of cement in 1942.

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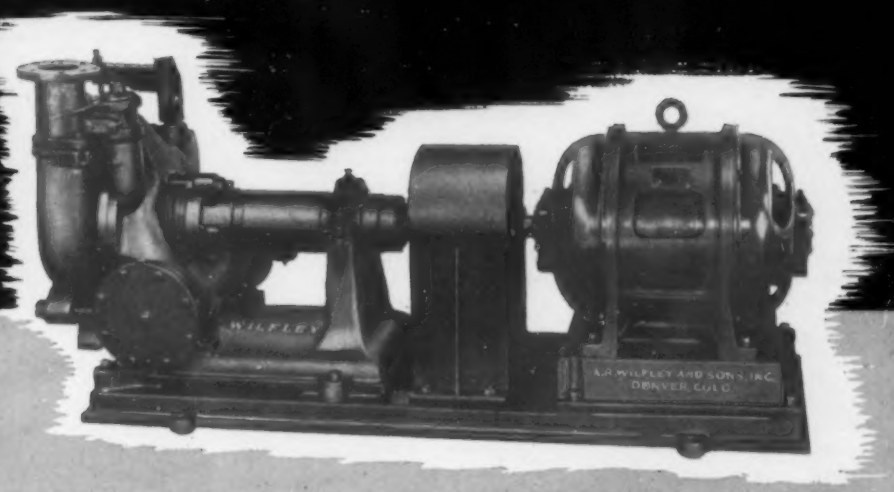
*TDA—the Dewey and Almy Chemical Company's trademarked name for its catalyst, dispersing agent, grinding aid used in the manufacture of portland cement.

Purchase Quarry

HOLT & MURPHY CO. has purchased the crushed stone plant at Rainier, Wash., owned by the late A. G. Held. The transaction involved the Columbia River plant's machinery, buildings, trackage and docks.

Start Up Mica Mine

THE GROTON MICA CO., INC., Franklin, N. H., has started operations, and is now processing mica for electrical insulation material.



KEEPING UP THE GOOD WORK

The Wilfley High Efficiency Pump is noted for "keeping it up" day after day and month after month. It's the pump that puts in "three shifts" EVERY day on basic pumping jobs that never give a pump a chance to rest. It's the pump that runs continuously without attention. Exclusive features of design and construction, plus correctly engineered application, make this dependable performance a routine matter with WILFLEY... Heavy pumping parts of rubber, alloy iron, alloy steel–correctly engineered to your exact requirements. Write for complete details if you want increased production without interruption.

A. R. WILFLEY & SONS, Inc., Denver, Colorado
NEW YORK OFFICE: 1775 BROADWAY, NEW YORK CITY

WILFLEY
centrifugal PUMPS

Automatic Controls

(Continued from page 78)

pilot so that dampers assume a position proportional to the controlled air pressure from the recorder-controller. Thus, the dampers are throttling and are capable of making small increments of change.

As temperature falls off at the feed end, due to increase in feed rate, the dampers open further, carrying the hotter gases forward at a faster rate to restore the temperature. Chart, Fig. 4, shows the record obtained at the feed-end. Although acting independently of the discharge end, this feed-end control has a very important bearing over the final discharge temperature for the reason that the feed-end control tends to anticipate any changes in load and does make it possible to maintain a constant and uniform temperature gradient through the length of the kiln regardless of variation in load.

It is the writer's contention that this maintenance of a uniform temperature gradient through the length of the kiln is responsible for the greatly improved over-all operation of the kiln. By coordinating feed-end and discharge-end temperatures, the entire system is stabilized, making it possible for the fuel input to become adjusted immediately to meet changes in load. This change in load might be variation in tonnage, change in chemical composition or water content.

To summarize, overall uniform temperature control can be had with proper selection of equipment. A coordination of feed-end control with fuel feed at discharge-end is necessary to "anticipate" changes in fuel demand with change in load to kiln.

Operating Results

After 24 months' operation, the following deductions can be made:

A. The initial investment has been justified many times over.

B. Equipment has required a minimum of supervision and maintenance with little or no expense.

C. Direct saving in fuel by eliminating the wasteful practice of "spilling" up the flue excess heat when it was found the kiln was too hot.

D. A direct economy has resulted from longer kiln lining life, due to maintenance of a uniform temperature gradient through length of kiln. The shell of the kiln is subject to less stresses and strains for the same reason.

E. A direct economy has resulted in an improved product. Particularly, this was shown in a better pebble formation which made for better handling in subsequent processing in a ball mill.

F. A direct economy has resulted due to a much longer continuous operation of kiln before shutting down for overhauling.

G. The users reports that this kiln is now "on production" 90 to 95 percent of the time. Before the addition of automatic temperature control, the operating periods were relatively short, and the kiln was out of service approximately 50 percent of time for relining and other repairs. One factor contributing to frequent shut-downs for repair was the formation of a heavy mud-ring 30 or 40 ft. from the discharge-end. This troublesome condition has been largely eliminated.

Facts About Synthetics

CONTINENTAL RUBBER WORKS, Erie, Penn., has published and is now distributing an interesting booklet entitled, "Facts About Synthetics." All the new synthetic rubbers and related synthetic products, their chemical composition, name of manufacturer, uses, and properties are described in considerable detail.

The Williams "SLUGGER" Crusher and Pulverizer Handles "ONE MAN" Stone • Saves Sledging

Also Makes 1¼", ¾" or Agricultural Limestone in One Operation

CUTAWAY VIEW of "Slugger" showing heavy duty hammers, liners and discs.

By reducing large rock to 1¼", ¾" or agricultural limestone in one operation, the "Slugger" has enabled operators to produce these sizes at a low cost per ton and with small investment.

Features include—Manganese steel hammers, heavy duty SKF bearings, adjustable breaker plate, hammer adjustments overcome wear, economical to operate.

The "Slugger" is built in Seven Sizes—from 30 to 150 horsepower —write for illustrated bulletins today.

The Williams Patent Crusher and Pulverizer Co.
800 St. Louis Ave., St. Louis, Mo.

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OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

WILLIAMS

PATENT CRUSHERS GRINDERS SHREDDERS

THIS is more than a war of mechanical monsters clashing in the night . . . more than a war of production.

It is a war for markets—*your* markets! The Axis wants your business—wants to destroy it for once and all.

With so much at stake, there is no doubt you will want to do everything you can to meet this Axis threat. Two ways are open: Speed production and BUY BONDS. The only answer to enemy tanks and planes is *more* American tanks and planes—and your regular, month-by-month purchases of Defense Bonds will help supply them. Buy now *and keep buying.*

HOW THE PAY-ROLL SAVINGS PLAN HELPS

When you install the Pay-Roll Savings Plan (approved by organized labor), you not only perform a service for your country but for your *employees.* Simple to install, the Plan provides for regular purchases of Defense Bonds through voluntary pay roll allotments.

Write for details *today!* Treasury Department, Section R, 709 Twelfth Street, NW., Washington, D. C.

U. S. SAVINGS

Bonds ★ Stamps

This space is a contribution to Victory by

ROCK PRODUCTS

GAYCO LEADS

THE CEMENT INDUSTRY

TO INCREASED CAPACITY AND GREATER RECOVERY OF FINES!

WRITE TODAY

Cement mill operators everywhere report that GAYCO Air Separators have increased their capacity 25 to 40% with 25 to 30% greater recovery of fines. They materially increase the capacity of all types of grinding mills by removing the fines as they are made and preventing the cushioning effect of the fine material.

Easily adjusted to deliver products of any desired screen analysis from 60 to 400 mesh, and when once adjusted they are not affected by variations of speed or rate of feed. Always produces the same uniform products at the same setting. Adjustment for any product can be noted and returned to at any time.

One of the exclusive GAYCO features is the new type adjustable centrifugal sizing fan for rejecting coarse particles.

UNIVERSAL ROAD MACHINERY CO.

RUBERT M. GAY - DIVISION

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N. Y. C., U. S. A.
"RELIANCE"
Crushing, Screening and Washing Equipment

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Canadian Representative
F. H. Hopkins & Co., Ltd.
340 Canada Cement Bldg.
Montreal, Que., Can.

GAYCO

GAYCO CENTRIFUGAL SEPARATORS

War Products

(Continued from page 94)

Such a conveyor should be suitable for the handling of hot material, and, therefore, rubber-belt conveyors and similar equipment can not be used. As machines suitable for this purpose may be mentioned a pan conveyor, elevator, drag-chain conveyor and reciprocating conveyor. Which machine should be chosen depends upon the local conditions and what equipment may be available in the plant, but one thing should be kept in mind, that the machine causing the least wear and tear on the nodules is to be preferred.

A point which is of great importance when considering the conversion of a cement plant is the location. The materials to be processed by the cement plant have to be transported to and from the plant, and in order to avoid too much cross hauling of materials, it is necessary that the location of the cement plant relative to the location of the supplier of the raw materials and the consumer of the processed products be considered carefully. With specific regard to the nodulizing of iron ores it is very fortunate that many cement plants are located in the same areas as a large number of steel plants, and, therefore, it will no doubt be found that also for this reason many cement plants may choose to take up nodulizing of iron ores. The situation would become even more favorable if processing-in-transit freight rates can be established.

[F. L. Smidth & Co. has prepared a map showing the approximate locations of cement plants and blast furnaces in the United States, which will be sent upon request.—The Editor.]

This trowel had thirty lives!

Even after shaping 30,000 feet of concrete pipe, the surface wear it showed was within permissible tolerance!

EMPLOYED FOR SHAPING the bell-end of machine-made concrete pipe, this revolving trowel had to continuously withstand the grueling abrasion of crushed stone, sharp sand, and cement aggregate. A terrific punishment! Neither Swedish steel nor hardened tool steel could take it! Even a trowel cast of alloy steel quickly succumbed so that costly replacement became necessary every 800 feet.

Finally, Coast Metals Hard-Facing was tried. The trowel was made of a low carbon steel, cast undersize and then built up to dimensions with an exceptionally wear-resistant Coast Metals Coating. The results proved outstanding! Over thirty times the best service previously obtained!

Why not try Coast Metals Hard-Facing in solving *your* wear-resistance problem?

COAST METALS, INC.
Plant and General Offices: Canton, Ohio
Executive Offices: New York, N.Y.

COAST METALS
hard-facing weld rods

YOUR EQUIPMENT'S LIFE PRESERVER AGAINST WEAR

More Magnesite In 1942

FIGURES released by the Bureau of Mines show that the production of crude magnesite established a new record in 1942, increasing 33 percent over 1941. The production of magnesium compounds from magnesite, brucite, dolomite, sea water, well brines, and lake brines also increased. Such compounds, principally the oxide, chloride, carbonate, and sulfate of magnesium have a number of industrial applications, including use in refractories, in making magnesium metal, magnesia insulation for boiler pipes, and medicinals. Dead-burned dolomite, employed chiefly as a steel-furnace refractory, increased 15 percent in quantity output in 1942 compared with 1941.

Mine output of domestic crude magnesite in 1942 reached the all-time high of 497,368 short tons, an increase of 33 percent over the 1941 production of 374,799 short tons.

Shipments of dead-burned dolomite in 1942, stimulated by requirements of the steel industry, were 15 percent greater in quantity than in 1941. Dolomite has long been used as a basic refractory for open-hearth maintenance and repair, averaging five to eight times the quantity of magnesite used for refractory purposes. Only recently, however, has dolomite invaded the metal field, competing with and supplementing magnesite and brines as a source of magnesium metal and magnesium compounds.

Olivine a Possible Source of Magnesium

OLIVINE is being investigated as a possible mineral source of magnesium metal. According to the Bureau of Mines, there are known deposits of several million tons of olivine in the United States, principally in North Carolina, Georgia and in Washington near Seattle. Olivine, averaging 45 to 49 percent magnesia, has a higher magnesium content than any other mineral except brucite. The commercial mining of olivine in the United States began in North Carolina in 1930, and most of the current production comes from North Carolina and Georgia because of their favorable location to power and transportation facilities.

BIG PUSH CALLS FOR STEEL

Scrap faster . . . Win sooner!

With Axis morale sinking faster under every bombing . . . with American boys already helping to crack the fortress of Europe ahead of schedule . . . we're setting up the Axis for the final hay-maker!

That means an advance behind a curtain of shrieking steel . . . continuous barrages blasting our enemies round-the-clock until they say Uncle!

THE TIME IS NOW

So our war planners have flashed an urgent message to *keep the steel coming.* And remember, half of the huge production will be scrap. Will we make it? Of course we will!

We'll make it because every pound of that steel scrap now so urgently needed will help to shorten the war by just that many days, hours and minutes!

We'll make it because that means saving the lives of so many dear to us.

We'll make it because 300,000 tons of steel in the next quarter will go into farm implements . . . to till and tend those extra acres that will feed our fighters . . . and the home front, too.

BE WISE — ORGANIZE!

So *organize* your scrap drive . . . make it a continuous operation . . . in charge of a square-jawed executive with authority to keep it rolling!

And segregate your steel types, wherever possible, according to alloys and grades. It will save time all along the line . . . get your steel into the fight faster!

No matter how many times you have looked . . . look again . . . and *keep right on looking!* For only then will the furnaces be able to push capacity to the limit. . . . Only then will the tanks, planes, ships and guns be ready for the ferocious onslaught that can and must spell the utter destruction of Axis tyranny!

WHAT IS DORMANT SCRAP?

Obsolete machinery, tools, equipment, dies, jigs, fixtures, etc., which are incapable of current or immediate future use in the war production effort because they are broken, worn out, irreparable, dismantled or in need of unavailable parts necessary to practical re-employment.

●

FOLLOW THIS RULE

If it hasn't been used for three months, and if someone can't prove that it's going to be used in the next three—sell it*—or scrap it.

*Scrap and used equipment dealers pay well for usable machinery and materials.

BUSINESS PRESS INDUSTRIAL SCRAP COMMITTEE

ROOM 1310, 50 ROCKEFELLER PLAZA, N. Y. C.

If you have done a successful salvage job at your plant, send details and pictures to this magazine.

SEND FOR PRIMER OF INDUSTRIAL SCRAP TO HELP YOU TACKLE THE SALVAGE PROBLEM

BUSINESS PRESS INDUSTRIAL SCRAP COMMITTEE
ROOM 1310, 50 ROCKEFELLER PLAZA, N. Y. C.

Please send a "Primer of Industrial Scrap" to

Your name .....

Company name .....

Company address .....

Rock Products—August, 1943

Electronics

(Continued from page 104)

incorrect operation quickly detected.

In trouble-shooting on electronic control, one should first make sure that the trouble lies in the electronic equipment. Is power available at the control panel terminals? Can the motor or other device be operated by alternate means (such as from a d.-c. bus by drum switch or magnetic control) if provided? Are all protective devices and interlocks outside of the panel operating properly? Has the cathode protective timer relay completed its timing cycle and applied anode power? Have mechanical adjustments been disturbed where items such as scanning heads or other mechanical components are used?

The times at which the failure occurs may be divided roughly into three: (1) when first starting a new equipment; (2) when starting after a normal shutdown; and (3) during operation.

New Equipment Fails to Start

When new electronic equipment fails to start, the cause may be a lack of correct power, incorrect or missing connections, tubes in wrong sockets, use of wrong or defective tubes, no fuses or wrong size fuse, or damage done to panel leads or parts in shipment.

Incoming power should be checked against panel nameplate. The remedy for no power, missing wires, and fuses is obvious. The position and type of tubes can be checked by referring to the wiring diagram and the panel stamping. Defective tubes and (sometimes) tubes in the wrong socket may not heat up. The glow of the hot cathode may usually be seen in glass tubes; in metal tubes the envelope becomes hot to the touch. (The envelope of metal thyratrons and ignitrons is at cathode potential. *Do not touch while power is on the panel.*)

Failure caused by breakage of leads or parts on panel is covered below under "Equipment Fails During Operation."

Equipment Fails to Operate After Shutdown

When electronic equipment does not operate after a normal shutdown, first check power, interlocks, and safety switches. The cathode heating timer relay may have failed or the anode contactor may be defective. An old tube often fails due to expansion and contraction as power is switched OFF or ON. Filament or heater burnouts may be detected quickly by inspecting glass tubes or by feeling metal tubes for heating. *Power should be removed before touching metal thyratrons and ignitrons.* Sometimes an overloaded transformer or reactor will fail due to the expansion cycle as power is moved and applied. Here, however, warning of failure is usually given by excessive heating, the odor of the hot material, melting of the sealing compound, or smoking or charring of the insulating paper.

Failures caused by leads or parts going bad during shutdown are covered below.

Equipment Fails During Operation

If after a period of satisfactory operation, the equipment's operation quickly becomes unsatisfactory or ceases altogether it is often possible to isolate the trouble to a specific cause by noting the exact symptoms of the failure. Power failure or a blown fuse result in an instantaneous change in the equipment's operation. An overloaded transformer, resistor, or wire is usually indicated by heat and smoke before total failure occurs. The cause of overload — whether short-circuit, load coil burnout, or motor-bearing failure—must

● By any definition and by all odds cement is the most important and most useful "plastic" so far discovered. It is just as "synthetic" as the latest front page marvel and its continuous kiln was the pioneer continuous chemical process.

Like Cinderella, pushed into the background by a more showy and assertive sister industry, cement will inevitably be a princess when peace returns and the nation resumes building highways, dams, levees, bridges, elevators and industrial shelter of all kinds.

In the post-war era, the cement industry will have in Norblo Dust Collecting Equipment an important ally in production and plant maintenance.

Norblo
DUST COLLECTION
THE NORTHERN BLOWER COMPANY
6409 BARBERTON AVENUE • CLEVELAND, OHIO

be found and corrected before the equipment is again placed in service.

A failure in a tube cathode circuit permits the cathode to cool gradually over a period of seconds or even minutes. Therefore, the loss of operation may be gradual rather than sudden as in the case of power failure. However, small rectifier- and battery-operated tubes cool quickly.

If none of the above causes for failure are evident it will be necessary to go carefully through the operation of the circuit and to analyze each step. An instruction book for the particular panel or at least an elementary diagram of the circuit should be available. If the circuit is at all extensive, it is usually possible to divide it into two parts, for example, the control and power circuits of a welding control. Then it may be possible to use a meter, electronic voltmeter, cathode ray oscilliscope, or some other means to determine whether or not the control section is operating correctly as the input is varied over the normal range. Likewise, a simulated control signal may be applied to the power circuit to test that half.

In a similar manner, each part of the circuit can be further subdivided until the faulty circuit or part is found. With a clear knowledge of each part of the circuit, this procedure can be carried out quite rapidly. It is a good idea to check the operation of panels while they are operating correctly and to record voltages found and cathode ray traces seen between specific points. In this way, the differences found in a defective panel will be immediately evident, and the trouble-shooting will take much less time.

If trouble is recurring in certain parts of the circuit, the manufacturer should be notified. Quite often a more permanent solution may be offered or the assistance of the manufacturer's design engineers may be obtained to suggest a cure. Sometimes, slight modifications in the equipment may be proposed to provide more desirable characteristics for the particular installation. In every case, complete information from the panel nameplate as well as a description of the part and the trouble found should be given to the manufacturer so that assistance may be rendered quickly and effectively.

County Buys Gravel Pit

PIKE COUNTY, OHIO, has purchased the property of the late Jacob Schmidt south of Waverly, Ohio, for the purpose of developing a gravel pit for the county.

Recommendation for Wire Rope

THE NATIONAL BUREAU OF STANDARDS has announced that printed copies of Simplified Practice Recommendation R198-43, Wire Rope, are now available. General adherence to the recommendation will result in a net reduction in variety from 973 to 643 or 33.9 percent. The major production and use of wire rope, and, therefore, the predominant tonnage, is covered by four different constructions, where the reduction in variety will be from 352 to 182, or 48 percent. Copies of the Recommendation may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10c each.

Leaves Yosemite

C. H. U'REN, purchasing agent for the Yosemite Portland Cement Corp., Merced, Calif., has resigned his position to become manager of a food manufacturing plant in Los Angeles. He has been associated with the cement company since 1926, when the plant was under construction, and has served in many capacities at the plant since it began operation.

RUGGED and DEPENDABLE HEAVY-DUTY TRUCKS from SMALLER UNITS

... and Uncle Sam Approves!

YOU NEED BIG-CAPACITY, HUSKY TRUCKS for today's jobs ... but you can't buy standard equipment of this type now.

QUITE A PROBLEM? NO!

For years successful operators with tough, difficult, heavy-duty, on or off-the-highway hauling problems have saved time, money, men and material with

THORNTON Four-Rear-Wheel DRIVE

From coast to coast in the U. S. A. and in countries all over the world, 1½ to 3-ton trucks have been converted with THORNTON units into DURABLE, FLEXIBLE, HEAVY DUTY VEHICLES that out-pull, out-last and out-maneuver standard trucks costing double or more.

Put TWO driving axles under the load instead of one, double the gear speeds, better springing and load flotation, with vastly superior tractive ability . . . all of this for less money!

Government approval? Yes, up to now. But these things are subject to change . . . so act quickly. Contact your nearest Truckstell-THORNTON dealer, or wire factory direct. Trained men will engineer this equipment to the requirements of YOUR PARTICULAR JOB.

THORNTON TANDEM CO.
8719-8779 GRINNELL AVE. DETROIT, MICH.
Manufacturers also of the THORNTON automatic-locking DIFFERENTIAL
"When you need TRACTION you need THORNTON"

New Man Is Safety Problem

Regional safety meetings of Portland Cement Association discuss successful methods of teaching safety to new employes

EIGHTEEN regional safety meetings held by the Portland Cement Association throughout the United States and Canada were successfully concluded on June 24 with an assembly of representatives of the Michigan cement mills at Detroit.

These meetings, which attracted an attendance of about 700 of the leading operating superintendents and supervisors of 130 cement mills and subsidiary organizations, were given over to the discussion of some of the more important problems which affect accident prevention under present conditions.

Manpower Problem

Since early in 1939 labor turnover has been on the increase in the cement mills as elsewhere, and as a consequence accidents among new workers have gone up steadily. In 1938 men on the job less than one year suffered only 7½ percent of the accidents, while this proportion increased to 18.7 percent in 1940 and 47 percent in 1942. For the first five months of 1943 this proportion of "new men" accidents was 62 percent and for May of this year it was 57 percent of the total. These figures were presented as evidence of the importance of the new man safety problem.

The situation was recognized as more or less common to all industry. The effects on the cement industry's accident totals and accident rates were due largely to the fact that protective mechanisms ordinarily effective in the handling of new men have become partially if not in some cases entirely inoperative. The first of these, *careful selection of new man*, cannot now be practiced with customary effectiveness in any plant in the country. Help now locally available is grabbed, not selected. The second protective mechanism, *good placement*, cannot be followed to any effective degree. The third, *training*, is working only partially, owing to overload on the supervisors and lack of a training system equal to the present demands. The fourth, *supervision*, may be inadequate, under present conditions, to keep all of the unusual proportion of new workers from the hazards following unsafe acts.

Here is a typical contributed outline from which to construct a working schedule for the guidance of the plant personnel officers in receiving new workers:

Recommended Routine for the Reception and Introduction of New Men

The suggested procedure below may be followed by either the employment man or foreman, or both:

1. *First Impression Should Be Friendly*
   a. Wear a smile.
   b. Tell him your name and get his.
   c. Shake hands, if it comes naturally.
   d. Tell him the name of the superintendent.
   e. Show interest in him by friendly questions.
   f. Express a desire to help him.

How to Secure
Accurate Feed Control
At Low Cost

You can completely control the flow of any size material from storage bins, hoppers or open-dump chutes to crushers, conveyors, screens, etc., with ROSS FEEDERS. Low in maintenance and power consumption. Furnished in sizes to suit your operation. Send full particulars for recommendations.

ROSS SCREEN & FEEDER CO.

19 Rector Street, New York, N. Y.
11 Walpole Road, Surbiton, Surrey, England

ROSS FEEDERS

g. Inform him you will welcome questions.

2. *Explain Pay System*
   a. What his rate of pay is.
   b. How it is figured.
   c. When and how it is paid.
   d. Explain overtime, holidays, etc.
   e. That you will be glad to explain any pay question that may arise.
3. *Explain Important Rules and Regulations*
   a. General and fundamental safety rules.
   b. Working hours.
   c. Notice of absence.
   d. Passes and badges.
   e. Restricted areas.
   f. Plant protection regulation.
4. *Employe Service and Opportunities*
   a. Vacations.
   b. Medical service.
   c. Recreational activities.
   d. Educational opportunities.
   e. Promotions.
   f. Group insurance and hospital plan (if any).
5. *Acquaint Him with Places and Fellow-Workers*
   a. First-aid room.
   b. Wash room and sanitaries.
   c. Locker room.
   d. Stock room, stores and supplies.
   e. Time clock.
   f. Cafeteria (if any).
   g. Personal introduction to men with whom he will work and have contact.

Emphasis was placed on the fact that the golden opportunity to form lasting impressions occurs immediately on the arrival of the new employe. One of the speakers summed up much of the best thought on the subject when he said:

"The introduction of the new man to the plant should be done by his foreman, but the introduction of the new man to the safety policy of the plant should be done by the plant superintendent. In this connection we recall one plant in which, when the new employe has received his preliminary inspection he is taken to the office of the plant superintendent who gives him a private 15 or 20 minute talk on accident prevention, closing with the words: 'I may never have occasion to personally give you orders again, but remember this as long as you are in the plant that the first instructions you received were safety instructions, and they were given to you by your superintendent."

Selling Your Organization

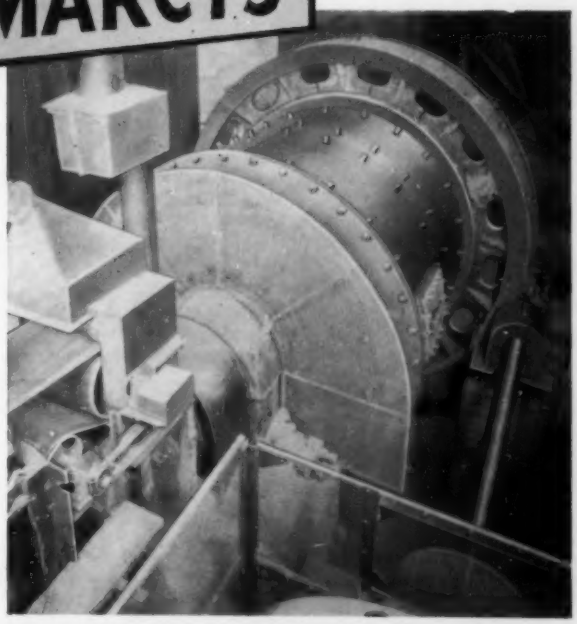
Many of the speakers agreed that the successful acquisition of the new worker depends more on "selling" the plant organization to him than on any other factor. One of the speakers said:

"Be sure to give the new employe the facts regarding the size of your plant and company, the years it has been in business, the amount of products it has produced and shipped, important jobs it has gone into, number of men on the payroll, length of service of some of the oldest employes and other such interesting information. For impression-creating facts of this kind it is best to 'tell' the new man as well as to give him printed statistical information."

Another speaker said:

"This is something about which we sometimes have a wrong impression in that we feel the selling can and should be done entirely by the superintendent, the safety director or the foreman. There is nothing quite so upsetting to the safety attitude of a new man as to get a profuse safety talk from a superintendent, a safety director or a foreman and then discover that the men on the plant safety committee are not sold on safety. It is almost a waste of time to try to sell a new man on safety

GRIND CLINKER *Faster* with MARCYS



Genuine Wilfley Tables; Massco-McCarthy Hot Millers; Rock Bit Grinders; Pinch Valves; Belt Feeders; LABORATORY EQUIPMENT; MINE AND MILL SUPPLIES.

Facilities for cement production have multiplied in recent months—thru enlargement and modernizing and by the construction of new plants. Marcy Mills, used internationally in the metal mining industry since 1914, are finding many new jobs to do in this expansion. The photograph above shows a 10-ft. Marcy Ball Mill used for grinding clinker. Since its installation another larger Marcy Ball Mill has been purchased by and delivered to the same interests . . . Inquiries on the use of Marcy Mills in cement manufacture will be answered promptly.

DENVER
SALT LAKE CITY
EL PASO
NEW YORK CITY

The Mine & Smelter Supply Co.

CANADIAN VICKERS, LTD.
MONTREAL
W. R. JUDSON
SANTIAGO, LIMA

and then have him discover in the next few days that the plant or departmental safety committee meets only because it is supposed to.

"In selling your plant organization to a new employe you are confronted primarily with the same problem that you encounter in selling your plant organization to all the employes. The keystone to that kind of selling is achievement—prompt attention to all practical proposals offered by a safety committee and prompt explanations of why impracticable proposals cannot be carried out. The superintendent who condemns a safety committee because of impracticable proposals has not yet learned that the only way to minimize impracticable proposals, without disbanding his safety committee, is to give prompt attention to practicable proposals."

Another:

"Following the safety talk given by the superintendent we firmly believe that each new employe should be shown as much as possible of the entire plant, and its workings explained to him in a simple manner by the foreman. We have always felt it to be a matter of regret, that many employes work for a considerable time doing a routine job without the slightest knowledge of why they do their work in a certain manner. If it can be shown that one man's particular work is a vital link in the chain of manufacture of portland cement, possibly he will take more interest in his work from an efficiency point of view, as well as safety."

Other new-worker subjects appearing on these programs included "What the New Man Should Know About Safety," "How the New Man Should Receive His First Lessons in Safety," "Good Will," "Good Example" and "How to Instruct the New Man on the Job." Some of the thoughts expressed in the discussion of the latter subject are particularly pertinent:

How to Instruct the New Man

What You Want to Do

Go back in your own memory. Remember how you felt the first day on a new job?—the time you were "stumped" by a new "wrinkle" on the job?—the time when you caused some scrap or re-work?—the time you got hurt?—the times when the boss corrected you and your work? Perhaps you liked the way he did it—or perhaps you didn't?

Any worker assigned to you feels the same way. He wants to make a good showing. You realize this. You are interested in four things:

1. Having the new worker come up to the quality and quantity requirements of production as quickly as possible.
2. Avoiding accidents which will injure the worker.
3. Avoiding damage to machines or equipment.
4. Spoiling as little work as possible.

How You Can Do It

Most of us just "jump right in" and start instructing or correcting a workman without much thought or planning. Perhaps you do the same. To instruct a man *rightly* takes just a little extra time at the moment, but it saves hours and days of time later on, and prevents a large part of the scrap, spoiled work and accidents.

How to Get Ready to Instruct

Here are four GET READY points you should take care of before instructing:

1. Have a time table. How much skill do you want the man to have? How soon?

2. Break down the job. You know that there is *one right way* to do every job. You know too that there are a few *"key points"* in every operation that make or break it. If these key things are done rightly, the whole operation is right. If any one of them is missed the operation is wrong. There is an easy, quick way to get the job clearly outlined in your mind. Fill out a "Breakdown Sheet," for each of your operations. It only takes three to five minutes. This is for your own use. It is not to be given to the worker.

3. Have everything ready: the right tools, equipment and materials. When you so much as "touch" a job in front of a worker, set the *correct* example. Don't use the wrong tool. Don't fumble. Don't excuse. Don't miss a trick. When *you* have everything right, *he* is more likely to do the same.

4. Have the work place properly arranged just as the worker is expected to keep it.

How to Instruct

Here is what you should do every time you instruct a man or correct his work:

1. Prepare the worker to receive the instruction. Put him at ease. Remember he can't think straight if you make him embarrassed or scared. Find out what he already knows about this job. Don't tell him things he already knows. Start in where his knowledge ends. Get him interested. Relate his job or operation to the final product, so he knows his work

MANGANAL

(Reg. U. S. Pat. Office. U. S. Patents 1,876,738—1,947,167—2,021,945)

11 to 13½% Manganese Nickel Steel

WELDING PRODUCTS

Bare and Special Tite-Kote Welding Electrodes

Cast Wedge Bars for Dipper-tooth Repointers

Applicator (Filler) Bars. Round, Square and Special Shape. Also Flat sizes for bucket repairs.

← Dredge Pump Impellor, repaired by welding with Manganal Special Tite-Kote Welding Electrodes, with overlay of Seaco hard surfacing.

SOLE PRODUCERS

STULZ - SICKLES COMPANY

134 Lafayette St. Newark, N. J.

is important. Put him in the right position. Don't have him see the job backwards or from any other angle than that from which he will work.

2. Present the operation; tell him, show him, illustrate, ask. "Put it over" in small "doses." He (the same as all of us) can't catch but six or eight new ideas at one time and *really understand* them. Make the "key points" clear. These will make or break the operation—maybe make or break him. Be patient—and go *slowly*. Get accuracy now — speed later. Repeat the job and the explanation if necessary.

3. Try out his performance; have him do the job, but watch him. Then have him do it again, but have him explain to you what he is doing and why. All of us find it easy to observe motions and not really understand what we are doing. Have him explain the key points. Correct his errors, but don't bawl him out or indicate that he is "thick" or "dumb."

4. Follow-up. Put him on his own. He has to "get the feel" of the job by doing himself. Tell him who he should go to if he needs help. Make this definite—yourself or someone *you* designate. The wrong person might give him a "bum steer." Check him frequently—perhaps every few minutes at the start to every few hours or few days later on. Be on the lookout for any incorrect or unnecessary moves. Be careful about *your* taking over the job too soon, or too often. Don't take it over *at all* if you can point out the helps he needs. Get him to look for key points as he progresses. Taper off this extra coaching until he is able to work under normal supervision.

At many of these regional meetings cement plant personnel staffs presented interesting skits showing just how they received new workers. Mistakes of the past were shown to impress the desirability of avoiding them in the future and suggestions were solicited for further improvement.

Chairmen of Safety Meetings

The following presided as chairmen at the various meetings: S. L. Greenawalt, safety director, North American Cement Corp., Albany, N. Y., May 20; W. M. Powell, safety director, Medusa Portland Cement Co., Baltimore, Md., Apr. 6; Jack Dempster, director of safety, Canada Cement Co., Ltd., Belleville, Ont., May 28; A. D. Stancliff, general superintendent, Lone Star Cement Corporation, Birmingham, Ala., Mar. 9; A. A. Oesterle, general superintendent, Federal Portland Cement Co., Buffalo, N. Y., June 22; A. E. Nunn, superintendent, Signal Mountain Portland Cement Co., Chattanooga, Tenn., Mar. 11; W. M. Powell, Columbus, Ohio, Apr. 21; Claude Rodarmel, superintendent, Oklahoma Portland Cement Co., Dallas, Texas, Feb. 24; P. H. Townsend, vice-president, Huron Portland Cement Co., Detroit, Mich., June 24; Jno. Norvig, general superintendent, Pennsylvania-Dixie Cement Corp., Easton, Pa., Apr. 8; A. E. Freudenreich, assistant plant manager, Universal Atlas Cement Co., Indianapolis, Ind., Apr. 27; Otto Schulzke, superintendent, Missouri Portland Cement Co., Kansas City, Mo., Mar. 30; F. L. Maus, safety director, Alpha Portland Cement Co., LaSalle, Ill., June 8; W. H. Leonard, vice-president, Riverside Cement Co., Los Angeles, Cal., Jan. 26; W. H. Patterson, superintendent, Lehigh Portland Cement Co., Mason City, Iowa, Apr. 13; W. M. Powell, Pittsburgh, Penn., June 15; J. W. Mather, vice-president, Missouri Portland Cement Co., St. Louis, Mo., May 11; A. J. R. Curtis, assistant to general manager, Portland Cement Association, Spokane, Wash., Feb. 8.

THE program of the American Road Builders Association and other programs for post-war development call for billions of dollars of expenditures for paving immediately following the war.

In order to profitably meet this demand producers will have to be equipped to meet increasingly rigid specifications.

More and more operators are turning to EAGLE Washers to meet these specifications . . . because EAGLE washers have been, and are doing a tremendously big job on wartime construction. You'll find them at work all over America, and following the colors to the far corners of the earth.

Write for information about EAGLE washing equipment now—plan for tomorrow's business today.

EAGLE IRON WORKS
DES MOINES, IOWA

Crushed Stone Safety Contest

RESULTS of the 1942 safety contest among crushed stone producers, conducted by the Bureau of Mines in cooperation with the National Crushed Stone Association, have been announced with the Tomkins Cove Quarry of the New York Trap Rock Corporation as the winner of the trophy for first prize. The Sentinels of Safety Trophy is provided by the *Explosives Engineer* magazine. Fifty-two plants, 48 open quarries and four underground mines, participated. The Tomkins Cove quarry, located in Rockland county, N. Y., was in operation 192,000 man-hours in 1942 without a lost-time or disabling injury to any employe throughout the year.

Thirteen other plants were awarded honorable mention for operating throughout the year with accident-free records. The plants and their records follow:

North Branford No. 7 trap-rock quarry, North Branford, New Haven County, Conn., operated by the New Haven Trap Rock Co., worked 135,761 man-hours.

Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., operated by the Marquette Cement Mfg. Co., worked 106,856 man-hours.

Verplanck limestone quarry, Verplanck, Westchester County, N. Y., operated by the New York Trap Rock Corporation, worked 98,601 man-hours.

North American limestone quarry, Martinsburg, Berkeley County, West Virginia, operated by the North American Cement Corporation, worked 91,727 man-hours.

White Haven sandstone quarry, White Haven, Luzerne County, Pa., operated by the General Crushed Stone Co., worked 81,334 man-hours.

Union Furnace limestone quarry, Huntingdon County, near Tyrone, Blair County, Pa., operated by the American Lime and Stone Co., worked 60,263 man-hours.

Winchester trap-rock quarry, Winchester, Middlesex County, Mass., operated by The General Crushed Stone Co., worked 55,085 man-hours.

Middlefield No. 1 trap-rock quarry, New Haven County, Conn., near Middlefield, Middlesex County, Conn., operated by The New Haven Trap Rock Co., worked 53,360 man-hours.

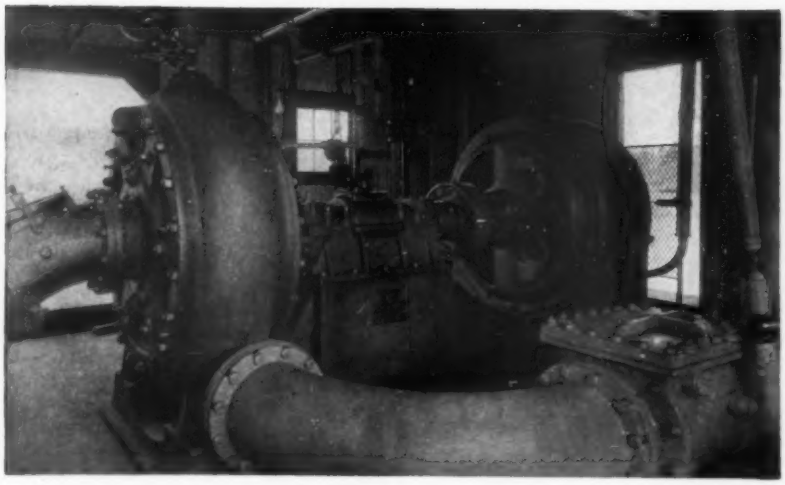
Auburn limestone quarry, Auburn, Cayuga County, N. Y., operated by The General Crushed Stone Company, worked 52,363 man-hours.

Rocky Hill No. 3 trap-rock quarry, Rocky Hill, Hartford County, Conn., operated by The New Haven Trap Rock Co., worked 44,101 man-hours.

Cheshire No. 6 trap-rock quarry, Cheshire, New Haven County, Conn., operated by The New Haven Trap Rock Co., worked 27,800 man-hours.

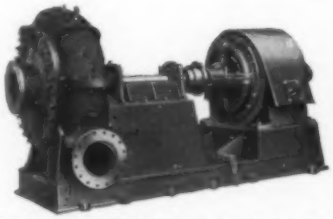
North American limestone quarry, Howes Cave, Schoharie County, N. Y., operated by the North American Cement Corporation, worked 26,369 man-hours.

Prospect limestone quarry, Prospect, Oneida County, N. Y., operated by the L. & M. Stone Co., worked 18,101 man-hours.

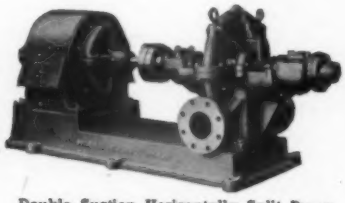


"It may be of interest to you..."

So wrote *an old-time customer when telling us that his 40-year old Morris Centrifugal Pump is still in daily service and too good to be replaced. It may interest YOU to know this too, for it indicates the stamina that has always been built into every Morris Pump. Whatever may be your pumping requirements, be sure to investigate Morris Pumps—they will give you high efficiencies and long troublefree service. Bulletins on request.*



Morris Heavy-Duty Lined Dredging Pump



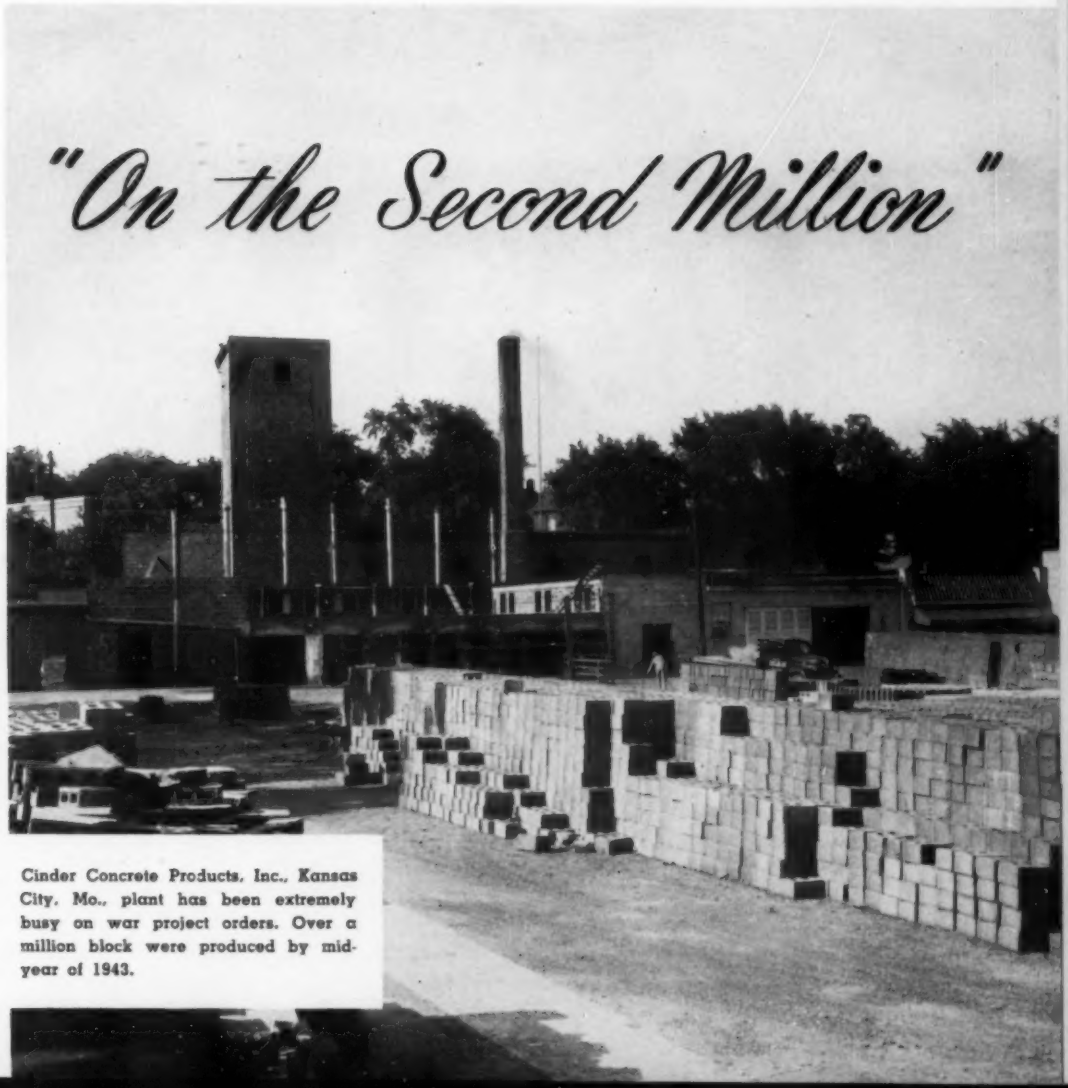
Double Suction Horizontally Split Pump for Clear Liquids

MORRIS MACHINE WORKS — MORRIS — ESTABLISHED 1864 — BALDWINSVILLE NEW YORK

CENTRIFUGAL PUMPS

CONCRETE PRODUCTS AND CEMENT PRODUCTS

"On the Second Million"



Cinder Concrete Products, Inc., Kansas City, Mo., plant has been extremely busy on war project orders. Over a million block were produced by mid-year of 1943.

Sells Products By Telephone

Gray's Concrete Products Co., Sheffield, Ala., markets large volume of concrete masonry. Robert Gray handles all sales and operation

THERE is hardly anyone in the concrete products business in Alabama from Birmingham north, who does not think of Robert Gray, owner of Gray's Concrete Products at Sheffield, Ala., as a "live wire." We heard it so many times that we decided to investigate.

One of our first questions after we were able to get him in a corner where he could not be distracted—no easy task, for he directs, owns, and supervises a really busy concrete products business—was how he managed to sell his products.

Vibrating type, high-production block machine with pneumatic off-bearer

"I sell," said Mr. Gray, "exclusively by long distance telephoning. My plant should be on a railroad, but it's not, so I have to make the best of it, and I am undecided just what to do, whether to build a new plant and forget this one, or build a new plant in addition to this one—I could use it right now.

"In this section," he continued, "I have to reach a wide marketing area and I find it cheaper, quicker, and more effective to do my selling by telephone. My telephone bill runs to a considerable figure, but I think it pays."

After which interview Mr. Gray slipped out of the corner, to first answer a long distance telephone call from Birmingham, then direct the loading of several large semi-trailer trucks, figure out an estimate for a 22- x 28-ft. house for a customer, direct the mechanics to repair a steam leak in the curing room and attend to a few other odd jobs that fall to an executive, all within the space of a few minutes, it seemed.

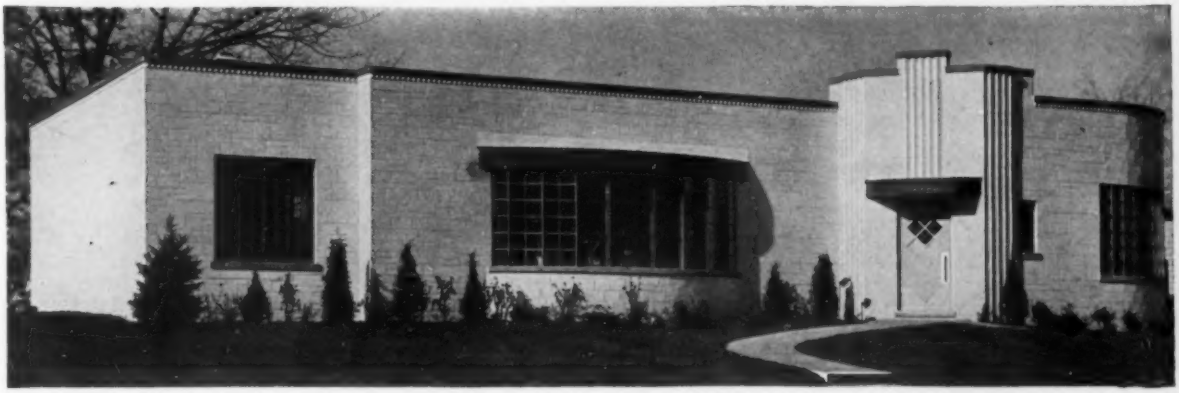
His methods must be effective, for he started in the concrete products business in August of 1941, in a very modest way. In November of the same year he purchased a Besser, a super unitized Vibrapac machine, and has been pounding it along, full-blast, ever since.

The machine turns out 6000 block per 10 to 12 hours. His capacity is limited to the capacity of his three low pressure steam curing rooms as he likes to steam treat the block 24 hours before storing in his yard, but owing to the urgency of defense needs in the Sheffield district, he has often had to run the Besser machine 24 hours and cut the curing time to 12 hours.

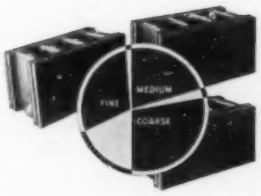
The next time we caught up with him he said, "I am up against it for rubber for my Barrett lift trucks. The rationing board will allow me rubber for trucks, semi-trailers and my car but not for the lift trucks. So," he continued, "I have to use three men to push a rack because of the iron wheels that I had to put on as there is no rubber, and I am now working on a scheme to use a tractor with a hydraulic lift because I've got

Roll crusher used in preparing cinders for aggregate

Vibrapac Concrete Masonry Units The New Building Material

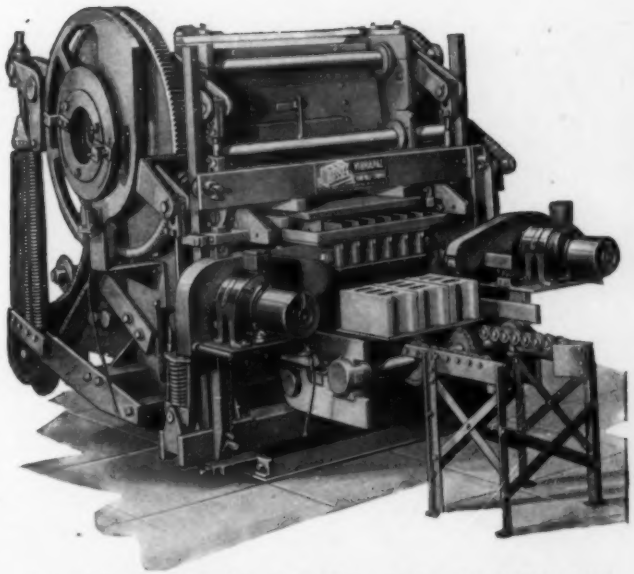


Vibrapac concrete masonry units in the hands of skilled architects and builders have become in effect a new building material.



The vibration method is now recognized as producing a new height of perfection in concrete masonry units. With the Vibrapac the units can be varied and controlled in density and texture as required for any special purpose such as soundproofing, appearance in wall finish, or as an acoustical corrective.

Vibrapac units are manufactured by such high production methods that the cost makes them one of the most economical of all building materials. Vibrapac units not only provide the greatest protection and insulation at no extra cost, but also provide the minimum of upkeep with permanent satisfaction in comfort and beauty.



Besser Super Automatic Plain Pallet Vibrapac. Capacity 600 8"x8"x16" per hour made 3 at a time on one plain pallet. Smaller units made in large multiples on the same pallets.

Important Patent Notice

Licensed under the Colbman basic vibration patents.

Undirectional vibration licensed under Flum patents.

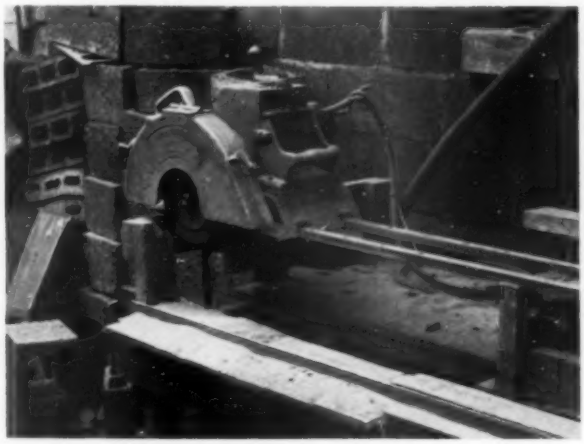
The Vibrapac combines vibration with exclusive patented Besser Plain Pallet principle.

BESSER MANUFACTURING CO.

208 Forty-Third St. • Alpena, Mich.

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER



Left: Tractor which is being remodeled as a lifting and transportation unit for hauling block. Right: Stone saw which is used to make special sizes from standard block

to get the block into the kilns and into the yard faster."

With that he was off on another mission.

When we commented on the fact that he had a three-story building, all of concrete block construction, he said:

"Yes, this plant just sort of grew. At first I used to grind cinder in hammer mills, crushers, etc., and after spending around $8000 on learning how to crush cinders, I finally put in a set of 34- x 14-in. Universal rolls and my troubles were over. The stuff is abrasive and hammers on a hammer-type mill only lasted a few weeks at most, but those rolls work fine.

"I also used to elevate my cement," he said, pointing to a three-story structure, "but it almost broke me due to mechanical troubles, so I built a ramp and dump my cement directly into the 42-cu. ft. Stearns mixer.

"The clinker is hauled up the same ramp and the bucket elevator delivers it to those bins—excuse me, please," and he was off again on a trot.

Mr. Gray's business is built around the use of cinders and Superock. The latter product he feels is a very excellent material, but owing to the fact that he is not on a railroad makes trucking expenses high.

In the yard, block are stored at unusual heights, and it shows the result of a busy factory. Many men loading and unloading brick, trimming them and running the "Take About" stone saw.

Later we corralled Mr. Gray in the office building that serves a threefold purpose. Upstairs is his home, downstairs is the office and in the rear of the office is one of the repair shops. However, behind the plant he has a second shop for welding and heavier repair work. Mrs. Gray has charge of the office. I asked him this time about business conditions in his field.

"I expect to be very busy all the rest of this year and well into next. I could use more trucks—I hire them on a contract basis, so much per block. There is one defense job just starting here, calling for 900 housing units, besides a lot of miscellaneous defense construction. There are no plants very close here so I have my hands full."

Above: Combination office and garage next to plant. Below: Concrete products plant of Grays' Concrete Products Co., Sheffield, Ala., utilizes gravity for handling materials

War Housing Projects to Use Concrete Products

United Cement Products Company operates 'round-the-clock to supply block to five big projects

By RALPH S. TORGERSON

WICHITA, KANSAS, is humming with activity resulting from the numerous war industries which it serves. However, housing for war workers has become such a serious problem that the government has found it necessary to alleviate the situation by the construction of 6000 homes under direction of the Federal Public Housing Authority.

Five housing projects have been planned and are now under construction in this area, but perhaps the largest and most typical of this work is the Planeview War Housing Project which will involve 4500 dwelling units, and which will house some 20,000 persons when fully occupied.

The dwelling units themselves are only of casual interest to the concrete products manufacturer as the only concrete masonry is to be found in the supporting piers for the frame structures. The business and shopping center for the Planeview War Housing Project is the main attraction as the three principal buildings are constructed of concrete masonry units. This construction may point to a trend in future housing developments of a more permanent character as the three structures in the commercial center, as it is called, may be very easily expanded in size to provide facilities for a larger population.

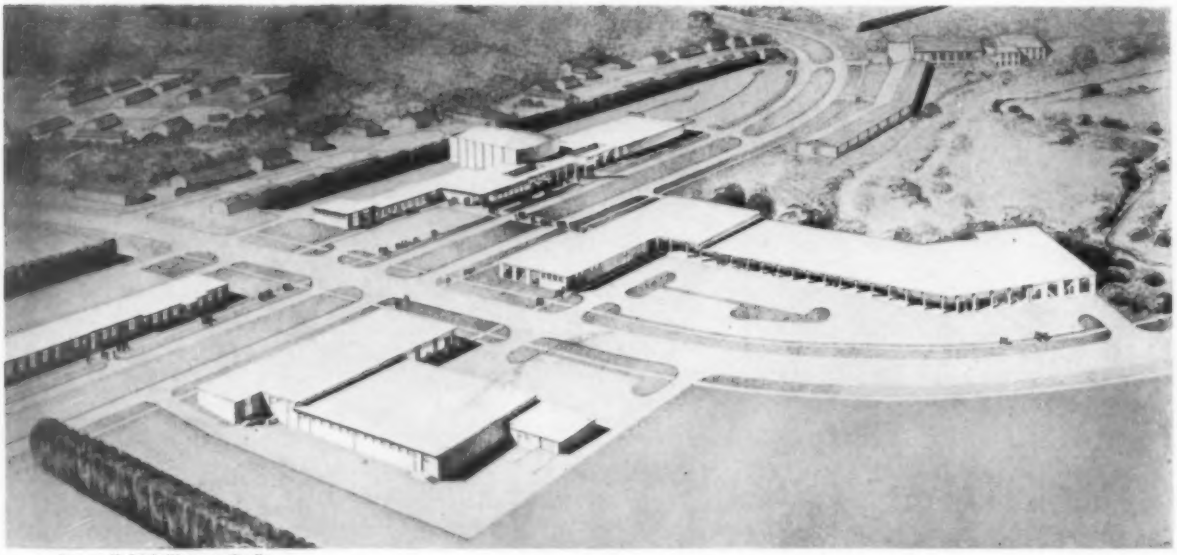
Above: Planeview recreation group includes theatre, bowling alleys and stores. Below: Arcade in shops group. Concrete masonry units for all walls, pilasters, etc

There are a number of interesting features in the three main buildings comprising the commercial center. The Shops group includes a cafeteria seating 350 people, two 8000 sq. ft. food stores, a variety store, and 10 smaller shops. The Recreation group has a theater seating 1000 people, a 16-lane bowling alley, a drug store, 10 doctors' offices, and a postal substation. The Department store group comprises a 20,000 sq. ft. store, a gasoline service station, and accessory sales room. All the buildings in this center are one-story structures, except the projection room in the theater. Some basements were provided for utilities, but most of the building area is constructed at ground level with ample concrete footings supporting concrete masonry foundations and walls. All floors are of concrete. Joists and girders are of wood. Roof sheathing is a laminated 2-in. gypsum board. Interior wall finish is of exposed 8- x 8- x 16-in. concrete block, including the partition walls. Ceilings are of gypsum board. The theater interior is of cinder block to secure the proper acoustical effect. All other walls are of concrete masonry block. Pilasters and girder points are of concrete block.

Roofs of all the buildings are insulated with 4 in. of rock wool. In addition, the theater building walls are filled with granulated vermiculite insulation. As a further protection to the public against heat and inclement weather, nearly all entrance areas to the three building groups are protected by permanent canopy construction supported by concrete masonry pillars.

Exterior concrete masonry walls will be either painted with a portland cement paint or have two cement coats grouted on walls.

Coal rooms will be protected with



Photo—Hedrick-Blessing Studio

Airplane view of Planeview war housing project commercial group as it will appear when completed

cement-asbestos board fire-resistant construction. The heating system will be forced-hot air with the main ducts of cement-asbestos board. These ducts, made by the Sall Mountain Co., are unique in that they are received flat like a collapsible carton, and are quickly assembled and installed with stiffeners. The ducts project across the ceilings and the warm air passes into the room through a grill type panel, which forms part of the decorative scheme.

To give some idea as to the size of the three groups of buildings in the commercial center, the Shop group has a floor area of 47,000 sq. ft.; the Recreation area is 37,000 sq. ft., and the Department store group comprises 20,000 sq. ft., exclusive of the gasoline service station.

The commercial center is being built with public funds by the Federal Public Housing Authority under the direction of Earl V. Gauger, director, Region VII, Kansas City, Mo. The contractor is the A. & B. Construction Co., Wichita, Kans., and the architect is Loebl & Schlossman, Chicago, Ill. Concrete block were furnished by United Cement Products Co., Wichita, Kans., of which Ralph Cowan is manager.

Over Million Block for All Non-Residential Structures

The United Cement Products Company is the largest producer of concrete building units in Kansas. This company is equipped with a Besser Super Vibrapac, four Anchor power tampers, a Dunkirk machine, and a Flam vibrator machine. Four mixers are installed on the second floor of the plant. A 30-cu. ft. mixer is placed over the Super Vibrapac. A traveling mixer, motor-driven on rails, and two stationary mixers complete the mixing equipment.

To facilitate handling materials, the company has its own railroad switch, and the aggregates are brought in by cars or truck and dumped direct into the elevator pit. Three large aggregate storage bins, with a capacity of 15 carloads, are built above the mixing room, and the aggregates discharge into the mixer hoppers by gravity.

Finished block are transported to the steam curing rooms by electric and hand lift trucks and are removed to the storage yard in the same manner.

Demand has required the operation of the plant with a day and night shift as the finished products are being shipped throughout central and western Kansas in addition to supplying the Wichita projects.

In addition to the Planeview commercial center, this company is furnishing concrete building units for Hilltop Manor and Beechwood non-residential buildings. These structures comprise a high school building, four grade schools, five auditoriums, four maintenance buildings, two fire stations, an administration building, and two commercial centers. The architect for the schools, auditoriums, and other buildings outside the commercial centers is Overend & Boucher, Wichita, Kans. W. R. Grimshaw Co., Tulsa, Okla., has the contract for all of these buildings with the exception of the Hilltop Manor auditorium, the high school building, the administration building, and the central warehouse building. The high school and the Hilltop Manor auditorium contracts are held by Dondlinger & Sons, Wichita, Kans. Busboom & Rauh, Salina, Kans., are building the main administration building, and the Consolidated Construction Co., Wichita, Kans., built the central warehouse. The Beechwood commercial center is being built by the Martin K. Eby Construction Co., Wichita, Kans.

Mineral Wool Industry Declared "Essential"

War Manpower Commission has declared the application of mineral wool for home insulation an "essential activity." This action was taken in the interest of fuel conservation as there is a likelihood of unavoidable fuel shortages next winter. Wharton Clay, secretary of the National Mineral Wool Association, received notice from the War Manpower Commission of the decision. Workers in mineral wool manufacturing plants had previously been declared "essential" by the W.M.C., due in part to extensive requirements for insulation by the Army and Navy. Extension of the classification to applicators is a logical development. Applicators and producers have also had restored to them the 40 percent gasoline cut in the Eastern states. This restoration of gasoline comes under Category A-2, O.D.T.

"Short Cuts" in a Block Plant

Cinder Concrete Products Co., Kansas City, Mo., standardizes and makes specials with masonry saw

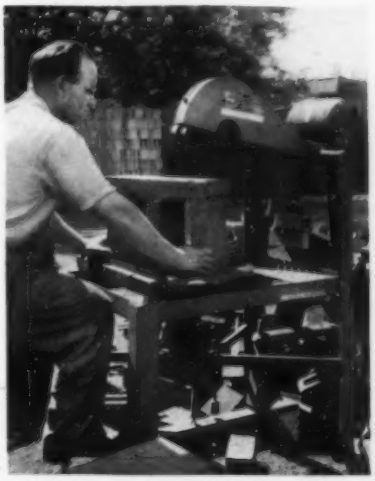
ONE OF THE BUSIEST concrete products plants in the Middle West is operated by Cinder Concrete Products, Inc., at Kansas City. With 1943 only half gone, this plant already has begun work on its second million block.

January 1, 1943, marked the beginning of a race against time; a race which will continue for many months although a record has now been established. George W. Goelitzer, vice-president and plant manager, together with Z. R. Mayhew, sales engineer, started the race last Fall by rolling up sales figures that have kept A. H. Waller, plant superintendent, busy devising new schemes to increase production.

One of the first short cuts to evolve from the overall plan was the decision to limit the number of different size and shape of blocks in production. To increase production, a practicable program of standardization became necessary.

Special sizes and fittings were all made on a large size Clipper masonry saw, and the block machines were continued full speed on the standard sizes.

As a further saving, wherever standard size units became damaged due to rough handling, it was a simple matter to convert these blocks into shorter lengths or special angles. Obsolete or cull materials were never a complete loss. Although production was mainly centered on large so-called war orders, the company realized the value of small orders and the necessity of maintaining contact with local builders, who for the most part will comprise the post-war market. The masonry saw was again called into use to help these customers build better block jobs by making special cuts to provide a more artistic effect for the owner.



Superintendent "Tony" Waller showing how an angle is cut on a 12-in. block with a masonry saw

Increases Plant Capacity for Standard Sizes

This plan has helped to increase plant capacity and to supply a larger number of jobs on a regular schedule. The contracts were largely for important war plants, some of which were a considerable distance away from the Kansas City area. Some of these big jobs included: the new Pratt & Whitney engine plant, the Sunflower Ordnance housing project, the North American bomber plant, and the housing project in connection with a sizeable Naval air base.

To move materials into the plant and deliver block to the jobs, Office Manager John M. Tucker had to keep track of 12 trucks hauling cinders from industrial plants and schedule four semi-trailer and five trucks for delivery of units. More than 1,000,000 block of 8- x 8- x 16-in. size or equivalent were made on a No. 9 Stearns Joltcrete machine since January, 1943.

Plant and storage yard of Cinder Concrete Products, Inc., Kansas City, with immense cinder storage in the left background

Seattle Concrete Products Firm to Expand

GRAYSTONE CONCRETE PRODUCTS Co., Seattle, Wash., has found it necessary to expand its capacity for manufacturing large cast concrete units, such as sewer pipe and culverts, piling, piers, and other items. Plant improvements being made include: the installation of a larger mixer, a 5-ton electric traveling bridge crane, enlarged storage bunkers, and the rebuilding of a sand and gravel elevator. The new facilities are expected to double capacity. President F. M. Kettenring, in commenting on the improvements, said, "We find an increasing amount of interest evidenced in pre-cast concrete products by the building trade. Because the materials required for manufacture are abundant, low in in cost and non-critical, we believe that pre-cast concrete products are destined to play an even bigger role in construction projects during the months and years which lie ahead. And lessons now learned will be profitably applied to the problems of post-war construction."

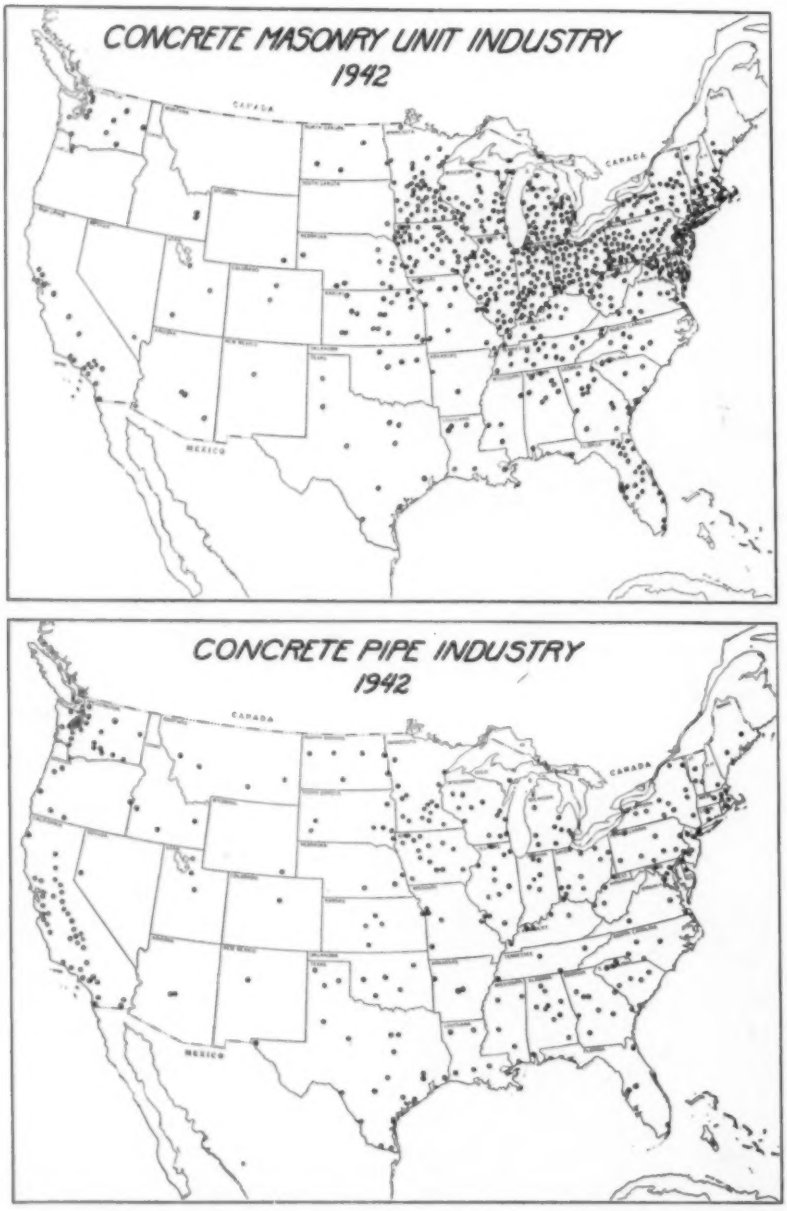
W.P.B. Reports on
Concrete Block and Pipe

A SURVEY just completed by W.P.B., Building Materials Division, reveals a total of 4,581,188 tons of concrete pipe and more than 301,096,071 concrete block were produced in 1942. Data on concrete pipe drawn from 432 plants, representing a 98 percent coverage of the industry, shows that these plants used 112,545 tons of reinforcing steel in 1942 and employed 11,949 workers.

Figures for concrete block production are reported in 8- x 8- x 16-in. equivalents. The 1,695 block plants reporting in the survey, representing a 75 percent coverage of the industry, manufactured 130,513,121 blocks made with light-weight aggregates in 1942 as compared with 151,641,073 in 1941; and 170,582,950 blocks made with heavy aggregates in 1942 as compared with 208,214,441 in 1941.

These plants employed 9,251 workers in 1942. A record production was reached by the concrete block industry in 1941.

The concrete block industry has large concentrations in the heavily populated areas, especially in the Lake and New England States and in Minnesota, Iowa, Pennsylvania, Maryland, New Jersey, and New York.



Maps showing the concentration of concrete block and concrete pipe plants in the United States

W.P.B. Grants Steel for Concrete Vaults

CONCRETE burial vault manufacturers have finally received recognition by the War Production Board of their claim for essential reinforcing steel and hardware. In an order dated July 26, the W.P.B. is now allowing manufacturers to use 15 lb. of reinforcing wire No. 10 gauge or heavier and 2 lb. of handling hardware. The industry also will be allowed an inventory of reinforcing steel not greater than a 60-day supply.

Information On Pipe

THE FLORI PIPE CO., St. Louis, Mo., is now distributing an interesting 64-page book on piping prepared by H. George Block. This new literature includes some valuable data on maximum allowable working pressures of seamless steel pipe, dimensions and prices of welded or seamless pipe, and drawings of proper pipe bends. Photographic illustrations show many applications for pipe.

Open Sandstone Quarry

THE L. A. WELLS CONSTRUCTION CO., Cleveland, Ohio, has purchased the old Couch sandstone quarry near Fry Road in Middleburg Heights, Ohio. After 25 years of inactivity, the quarry will be reopened and machinery installed to take out breakwater stone for placement along the Cleveland water front on Lake Erie.

Pioneer Dies

A. P. (PETE) NELSON of Spencer, Iowa, one of the big concrete products manufacturers of Iowa, died recently. Mr. Spencer was a regular attendant at the conventions of the National Concrete Masonry Association and was one of the most picturesque characters in the industry. He was noted for his unusual merchandising methods, which embraced territory comprising 90 towns in Iowa.

Electronics in Industry

NEW APPLICATIONS of electronics to industry were described by research engineers of Westinghouse Electric & Manufacturing Co., at an editorial luncheon on July 13 in Chicago to which representatives of the trade press were invited. It was announced that a new Industrial Electronics group had been created which will function to centralize all industrial application studies of the company. Led by A. C. Monteith, manager of industry engineering, who outlined what Westinghouse is planning to do in this organization, the subject was described in more detail by Carl J. Madsen, electronics engineer, going into the industrial application possibilities, and by Gordon F. Jones, electronics engineer, giving a brief review of electronic conversion of power. An interesting moving picture illustrated the great progress made in the application of electronics to industry, medicine, lighting, and military services.

Fundamental applications were divided into six classifications: rectifying, amplifying, generating, controlling, transforming light into current, and transforming current into light. Some of the industrial application of particular interest included: high frequency induction heating; the electron mass spectrometer for rapid analysis of chemical compounds; electronic control devices; industrial x-ray to detect defects in heavy castings; precipitation of dust, fluorescent lighting, and radar, the new war development to give advance warning of the approach of enemy airplanes or ships.

The meeting was thrown open for questions and answers after the talks by Westinghouse engineers. Among the questions and answers of interest to the industry was the matter of using electronics to make a separation of particle sizes. Studies are now being made of this problem and it is believed that this can be solved through the well-known principle that larger particles will take a heavier charge of electricity than smaller particles. The electro-magnetic separation of different minerals has been practiced for many years.

Farmers Buying Block

THE HARTFORD CONCRETE UNITS CO., INC., Hartford, Conn., is advertising cinder block for the construction of farm buildings, three times weekly, in the Hartford, Conn., newspapers. Stating that cinder units are not critical construction materials and that priorities are not needed for their use in structures for food production, this company has created a state-wide farmers' interest in masonry. At the end of the first week, cash sales of cinder units to farmers amounted to more than $600.00, and prospects for sales increasing seemed excellent.

In New Jersey many farm structures are being constructed of concrete masonry. The production of food demands additional facilities and lumber is difficult to get. In many cases the cost of masonry buildings prove to be lower than those of frame construction. Typical buildings are poultry houses, calf barns and storage buildings.

Above: Concrete masonry storage building for potatoes and gladioli bulbs. Center: Calf barn. Below: Stucco on concrete masonry addition to poultry house of same construction

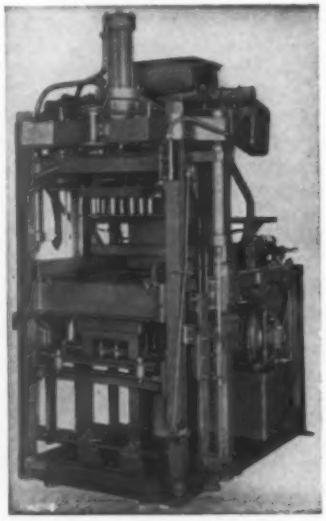
Invisible "Raincoat"

GENERAL ELECTRIC COMPANY'S research laboratory at Schenectady, N. Y., has developed, under the direction of Dr. Winton I. Patnode, an invisible "raincoat" which can be formed on cloth, paper and many other materials by exposing them to chemical vapors from a new compound.

Called Dri-Film by the G. E. Electronics Department which will market the new compound, one of its most important uses so far is the treatment of ceramic insulators for radio equipment being made for the armed forces of the United States. It is about nine times more effective than the wax used at present as a water repellent, and its results are permanent. Perhaps paper bags for cement, lime, gypsum, etc., can be treated with his product?

Dri-Film is a clear liquid composed of various chemicals which vaporize at a temperature below 100 deg. C. Articles to be treated are exposed, in a closed cabinet, to the vapors for a few minutes. Then they are taken out and, if necessary, are exposed to ammonia vapor. This is to neutralize corrosive acids which may collect during treatment.

HYDRAULIC
VIBRA-PRESS



A High Production Machine
Making Blocks which are
Demanded by the Contractor
Endorsed by the Architect
Desired by the Mason

The KENT MACHINE CO.
CUYAHOGA FALLS, OHIO

"ANCHOR"
Complete
EQUIPMENT AND
ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, palleta, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mchy. Co.
G. M. Friel, Mgr. COLUMBUS 8, OHIO

Vault Men Meet in New York

A STREAMLINED BUSINESS CONFERENCE of the National Concrete Burial Vault Association, Inc., was held at the Biltmore Hotel, New York City, on June 22 and 23. One hundred and thirty-nine members and guests registered.

The success of the conference was due to the untiring efforts of the chairman of the Conference Committee, John McCloskey, Forest Hills, N. Y. Members of his committee were: E. Whitter Clawson, Anthony DeStefano, Ben Elmore, Mark Milnes, George Painter, Jr., Murray Stow, and Frank Van Ness.

After the meeting was called to order by President W. W. Haase, Forest Park, Ill., Roland Schultheis, past-president of the New York State Association of Cemeteries, was introduced. He led the assembly in singing the national anthem.

GEORGE M. PAINTER, JR., chairman of the Membership Committee, reported that 35 new members were accepted during the past year. H. A. Dahlquist, Chicago, Ill., reported upon the Allied Memorial Council, of which N.C.B.V.A. is a member. J. R. Van Meter gave the report of the Advertising Committee and followed by reading the obituary report, in which it was recorded that the Association lost three widely known members during the year. They were Dan Trippear, Sr., Tacoma, Wash.; Bruce Carpenter, Tyrone, Penn.; and Ralph Mead, Cleveland, Ohio, who was the secretary-treasurer of the organization for a number of years. The financial report was read by Frank Mathies, secretary-treasurer, New Haven, Conn. Round Table discussions occupied the lunch hour of all members.

LOWELL K. HUBER, Cincinnati, Ohio, led the afternoon discussion on the Limitation Order of the War Production Board, aided by those men who worked with him on the Advisory Council to W.P.B., F. H. Van Ness, Brooklyn, N. Y.; H. A. Dahlquist, Chicago, Ill.; and H. F. Chandler, St. Paul, Minn. All phases of the order and the changes that have been made, as well as the possibilities of further revision, were taken up and thoroughly explained.

A technical clinic was conducted by Paul Woodworth, field engineer of the Portland Cement Association. Mr. Woodworth's annual addresses to the Association are always a convention highlight.

CRAWFORD T. PERKINSON, past president of The Association of American Cemetery Superintendents; past president of the New York State Association of Cemeteries, made a most interesting talk to the convention, pointing out the value of the Allied Memorial Council to all concerned.

GEORGE GOODSTEIN, legal council of The New York State Funeral Directors and Embalmers Association, made an address upon what he called "this shop-worn business of cooperation in Associations," but handled his subject so deftly and so convincingly that the convention gained greatly by hearing it.

THOMAS KILCOMMONS, Division of Motor Transport of O.D.T., explained various phases of the transportation problems in his address, being unusually well qualified to do so, since he is also a funeral director.

GEORGE P. BERNER, War Relations Supervisor, U. S. Employment Service, War Manpower Commission, explained the workings of the Commission, translated into practice by burial vault manufacturers.

MRS. JOHN MCCLOSKEY, MISS ELIZABETH MCCLOSKEY and MRS. WILLIAM FLANNERY were responsible for the entertainment of the ladies, which included a yacht cruise around Manhattan and broadcasts by Harry James and Fred Waring.

New Officers

The officers for the coming year are: President, E. C. Jefferies, Cleveland, Ohio; vice-president, George Painter, Philadelphia, Penn.; secretary-treasurer, J. R. Van Meter, Cincinnati, Ohio. New directors are G. P. Hereford, St. Louis, Mo.; E. N. Johnson, Pittsburgh, Penn.; holdover directors, W. W. Haase, Forest Park, Ill., Fred Washburn, Hudson, N. Y.; and Frank Bowen, Atlanta, Ga.

New Products Plant

J. E. DANIEL, JR., president and manager of the Helark Manufacturing Co., Inc., Malvern, Ark., is planning to establish several concrete products plants. These plants will make concrete block, joists, lintels, sills, and burial vaults.

$300,000,000 for Housing

BEFORE the adjournment of Congress, President Roosevelt asked for a $300,000,000 supplemental appropriation for war housing to be handled by National Housing Agency.

Make More Profits with Multiplex Flues

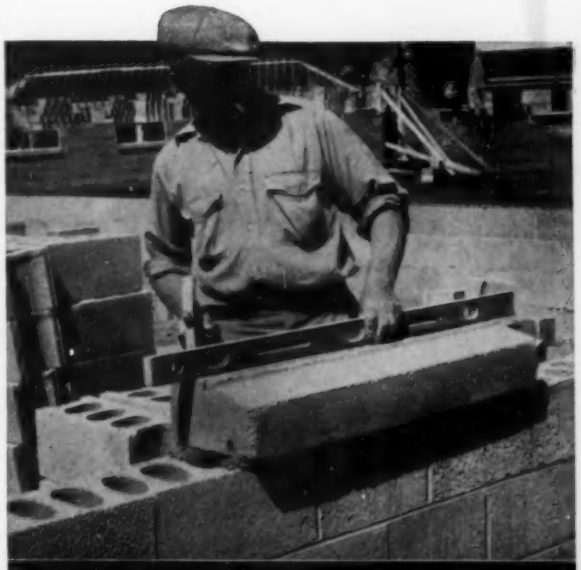
Only Small Investment Needed To Make $30 to $50 Profit Per Day

The Model "E" 16 x 16 Ventilated Chimney Block Machine is a great money-maker for contractors and block manufacturers. It's the only chimney block machine on the market that makes an absolutely fire-proof ventilated basement and house. The Model "E" has attachments for ventilator and stove pipe opening. Simple, easy, profitable to operate.

The Multiplex chimney shown here can be made to meet any code or specification. It is built to give perfect draft and ventilation.

Write for details.

MULTIPLEX CONCRETE MACHINERY
ELMORE, OHIO



Thousands of needed CONCRETE jobs *don't need* critical materials

In and around war industry plants, war housing projects and military centers, thousands of improvements are needed that should have the firesafety, durability, upkeep-thrift and low yearly cost of CONCRETE.

In many other areas, concrete materials are available for essential jobs that will boost farm and factory production.

These jobs frequently require no critical materials.

And since concrete materials are for the most part local, concrete construction involves minimum use of freight cars and trucks needed for moving munitions.

Concrete products men and concrete contractors can do their part today by showing industry executives, farmers and others how concrete construction will help get their production into high.

- War housing
- War factory additions
- Foundations and piers
- Milk houses
- Barns, poultry and hog houses and other animal shelters
- Granaries, corn cribs and other farm storage buildings

PORTLAND CEMENT ASSOCIATION
Dept. A8-45, 33 W. Grand Ave., Chicago 10, Ill.

A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work.

BUY WAR STAMPS AND BONDS

UNITED STATES TREASURY DEPARTMENT

For distinguished services rendered in behalf of the War Savings Program this citation is awarded to

Rock Products

Given under my hand and seal on June 9, 19 43

Henry Morgenthau Jr.
SECRETARY OF THE TREASURY

It's a satisfaction to recieve this citation. But the best reward for duty is the knowledge that every little bit brings us closer to victory. **Rock Products**

Good Outlook for Building After War

NATIONAL GYPSUM Co., Buffola, N. Y., in its report for the first six months' period of 1943 made an appraisal of after-the-war building activities. President Baker disclosed that plans are now being charted by the post-war planning department for turning over its 21 plants from wartime production to peacetime standards. He reported, "The building industry has an especially promising outlook for the post-war era. The accumulated shortages from the undersupply of building since the 1929 depression and the almost complete elimination of private construction since 1941 brings into immediate sight a potential need for one million homes annually for the next 10 years. Added to this will be a market for repairs, modernization, and the rebuilding of rundown commercial, industrial buildings, schools and other public institutions."

Marquette to Build Plant in Mexico

MARQUETTE CEMENT MANUFACTURING Co., Chicago, Ill., is arranging to finance and manage a new cement plant project in Mexico, according to a statement made by President W. A. Wecker. The plant will be built near Orizaba, in Vera Cruz State, where a number of heavy engineering projects are under way. The project will have a capital of 5,500,000 pesos or about $1,100,000. About $300,000 will be invested by Marquette in the preferred stock, and Mexican sources will supply the rest of the capital. Marquette also will provide technical and managerial service.

Conveyor Belting Has Breaker Cords Across Width

B. F. GOODRICH Co., Akron, Ohio, has announced that a patent has been granted on its Transcord Breaker construction in conveyor belting. In this construction, the breaker cords are placed across the belt width, rather than parallel with the cords of the belt itself. This is said to provide greater resistance to cutting action from materials striking the belt, which most often move faster or slower than the belt itself.

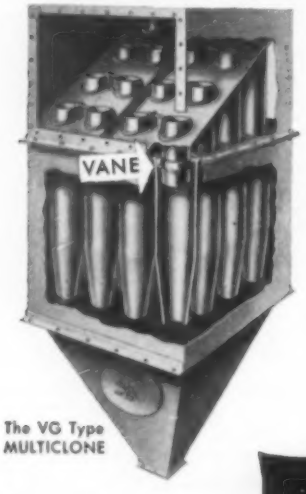
It is also claimed that the Transcord Breaker provides much greater adhesion between cover and carcass than the regular breaker construction. Tests of both types on conveyors in heavy duty service are said to have definitely proved this.

Two other advantages claimed for the patented construction are: It tends to stop most cuts and gouges before they penetrate to the belt carcass. The breaker is usually placed a short distance above the top ply, leaving a protective layer of rubber between breaker and carcass. This construction prevents distortion of the rubber cover beyond its elastic limit because of severe impact.

Why the Vane in the MULTICLONE Improves Dust Collecting Efficiency

Uniform Gas [illegible] Dust Recovery

IN REMOVING dust, fly ash and other suspended particles from gases, mechanical separators whirl the gas into a cyclone which centrifugally throws out the suspensions. Efficiency of this action depends upon the uniformity with which the whirling gas is distributed in the tube. The more uniform the distribution the greater the effect of centrifugal action upon *fine* as well as coarse particles, resulting in more complete recovery of ALL suspensions.



The VG Type MULTICLONE

In Conventional Cyclones gas enters through a single port in the side of the tube, forming a concentrated gas flow which leaves open spaces where eddies and secondary types of flow can form to cause turbulence and impair the cleaning efficiency of the unit.

In The Multiclone the vane distributes incoming gas into eight smaller cyclones, *uniformly spaced* around the separating tube. This finer breakup promotes smoother flow, better separation, higher recovery, improved efficiency!

This is just one of *many* basic advantages incorporated in the MULTICLONE... advantages that improve efficiency, decrease installation costs and reduce maintenance. Get the *full* story before installing any recovery equipment. Send for booklet!

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

MAIN OFFICES: 1016 W. NINTH ST., LOS ANGELES, CALIF. • CHRYSLER BLDG., NEW YORK
140 S. DEARBORN STREET, CHICAGO • HOBART BUILDING, SAN FRANCISCO, CALIFORNIA
PRECIPITATION COMPANY OF CANADA, LTD. • DOMINION SQUARE BLDG., MONTREAL

COMING CONVENTIONS

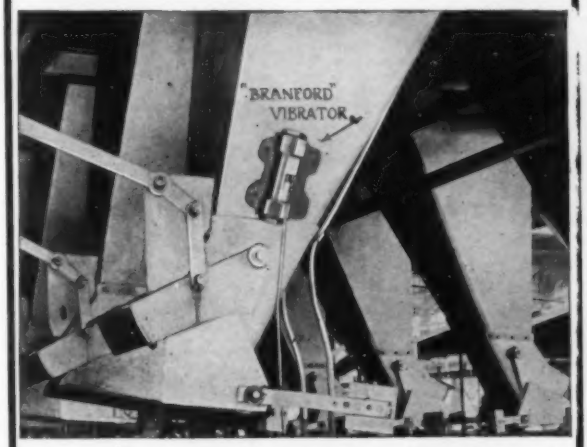
American Concrete Institute, Chicago, Ill., February 29 to March 2, 1944.

Chemical Industries Exposition, Madison Square Garden, New York, N. Y., Dec. 6 to 11, 1943

National Ready Mixed Concrete Association, Semi-annual Directors' Meeting, Netherland Plaza, Cincinnati, Ohio, August 20, 1943.

National Sand and Gravel Association, Semi-annual Directors' Meeting, Netherland Plaza, Cincinnati, Ohio, August 19, 1943.

"BRANFORD" PNEUMATIC VIBRATORS



If you are interested in increasing the efficiency of your material handling equipment, we suggest you write us for data on our Vibrators for use on Hoppers, Bins, Chutes, Concrete Buckets, Screening Devices or in any place where bridging over or hanging up of material occurs.
Prevents costly damage to equipment by sledging; cuts down labor costs and increases production.
We also manufacture *Vibrators* for *placing concrete*—Pipe Forms, Tanks, slabs, joists, etc.

NEW HAVEN VIBRATOR CO.
145 CHESTNUT ST. NEW HAVEN, CONN.

FASTEST POURING

Almost Any Job of Concrete Can be Done Faster with JAEGER TRUCK MIXERS

"HIGH DUMP"

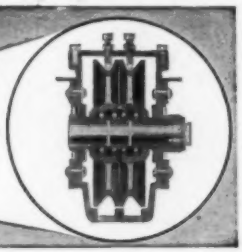
Millions of yards of Jaeger Truck-Mixed Concrete on major war work (exceeding the output of all other makes combined) prove the advantages of these motorized concrete plants. Nimble, flexible and fast, they speed placement, solve problem of extended or continuous pours.

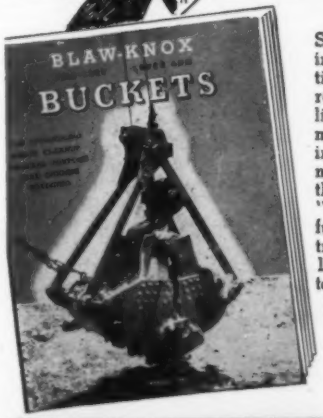
THE JAEGER MACHINE CO.,
603 Dublin Avenue
Columbus, Ohio

Mixers—Pumps—Hoists
Paving Equipment

or "LOW CHARGE" Type

BLAW-KNOX BUCKETS have SEALED BALL BEARING SHEAVES



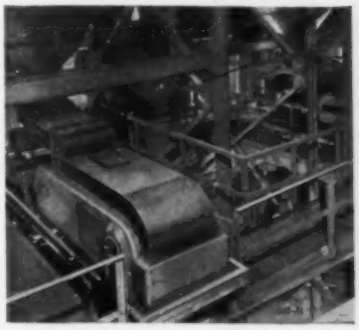


Sealed ball bearing sheaves in the lever arm reduce lost time and expense of bearing replacement, increase cable life and reduce friction, materially improving operating efficiency. This, and many other better features, that make BLAW-KNOX the "wise" buy in buckets are fully explained and illustrated in NEW CATALOG 1757. Send for your copy today.

BLAW-KNOX DIVISION
of Blaw-Knox Company
Farmers Bank Bldg.
Pittsburgh, Pa.

BLAW-KNOX
BUCKETS

BLAW-KNOX BINS AND BATCHERS · ROAD FORMS · STREET FORMS · CONCRETE SPREADERS · TAMPING ROLLERS · VIBRATORS
CONCRETE BUCKETS · CLAMSHELL BUCKETS · TRUCK MIXERS · STRIPPING MACHINES · FORMTRUCKS · ROAD FINISHERS · STEEL FORMS



ACCURATE GRAVIMETRIC FEEDING

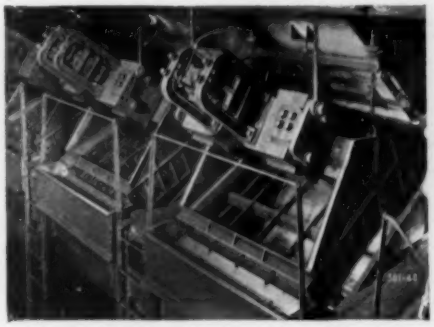
Jeffrey-Traylor Waytrols—precision machines for accurate gravimetric feeding, batching and proportioning. May be remotely controlled, interlocked with processing equipment and when desired weight totalizers may be supplied. Group of three Waytrols are shown proportioning and blending plant products.

Jeffrey-Traylor Waytrols will deliver a continuous uniform flow of a given weight per hour. Send for our NEW catalog No. 750-N—which goes into detail.

The Jeffrey Manufacturing Company
(Established in 1877)
935-99 North Fourth Street, Columbus 16, Ohio

SCREENING

J-T electric vibrating screens will give maximum "through screen" capacity and the ultimate in control and efficiency. Single or multi-decked styles—conveyanscreen or gravity type—deck sizes from 2 to 40 sq. ft.



FINANCIAL NOTES

RECENT DIVIDENDS

Alpha Portland Cement Co.	$ .25	Sept.	25
Bessemer Limestone & Cement Co., pfd.	.75	Oct.	1
Eastern Magnesia Talc Co. (p100)....(ext)	4.00	June	30
Kentucky Stone Co.	1.50	July	7
Medusa Portland Cement Co., Com. (np)		*July	6
National Gypsum Co., pfd.	1.12½	Sept.	1
Schumacher Wall Board Corp.	.20	Aug.	16
Schumacher Wall Board Corp., pfd.	.50	Aug.	16
Superior Portland Cement, Inc., Cl. B.	.50	Aug.	2

*Dividend omitted.

•

ALPHA PORTLAND CEMENT CO., Easton, Penn., has announced that the stockholders have approved a plan to retire 53,244 no par common shares owned by the company, reducing capital from $16,759,600 to $15,375,256. The retirement will increase surplus by $500,000.

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KENTUCKY STONE CO., INC., Louisville, Ky., presented the following income account for the years ended April 30:

	1943	1942
Net sales	$1,259,747	$939,688
Costs & expenses	905,773	685,181
Depr. & depl., etc.	98,392	94,989
Operating profit	255,582	159,518
Inc. bond interest	8,198	10,020
Income taxes	173,171	68,422
Net income	74,212	81,077
Prev. earn. surp.	177,197	136,141
Debits	36,881	40,021
Earn. surp., 4-30	214,529	177,197
*Times chg. earn.	31.18	15.92
Earned per share	$9.58	$10.46
No. of shares	7,750	7,750

*Before income taxes.

•

KELLEY ISLAND LIME & TRANSPORT CO., Cleveland, Ohio, reported net sales of $4,694,925 for the year ended December 31, 1942, as against $4,566,670 for the year ended December 31, 1941.

•

SOUTHERN PHOSPHATE CORPORATION, New York, N. Y., reported a net operating profit for the year ended December 31, 1943, of $155,765 as against $350,188 for a like period in 1942.

•

PEERLESS CEMENT CORP., Detroit, Mich., reported a net loss of $10,290 for the first three months of 1943 as compared with a net loss of $92 for a similar period ended March 31, 1942.

•

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., showed a net profit of $1,589,578 for the year ended June 30, 1943. This compares with $2,170,269 for the year ended June 30, 1942.

•

PENNSYLVANIA-DIXIE CEMENT CORPORATION, New York, N. Y., reported consolidated earnings for the 12 months ended June 30 as follows:

	1943	1942
Net sales	$10,812,938	$10,503,454
Cost, expense, etc	7,927,475	7,569,310
*Depr. & deplet.	511,035	504,670
Operating profit	2,374,428	2,429,474
Other income	45,562	36,425
Total income	2,419,990	2,465,899
Interest	190,718	213,574
Inc. & prof. tax.	1,297,500	699,750
Conting. reserve	.....	440,000
Net profit	931,772	1,112,575
†Times int. earn.	12.69	9.49
Earn., pfd. share	$7.69	$9.18
‡Earn., com. sh.	0.21	0.66
No. of pfd. shares	131,200	121,200
No. of com. shs.	400,000	400,000

*Additional depreciation charged to special reserve: 1943, $439,285; 1942, $445,842.
†Before income and profits taxes.
‡Disregarding preferred arrears.

YOUR JOB IS PLAT-O's JOB

On scores of screening jobs covering the widest range of operating conditions, these facts about PLAT-O Vibrating Screens have been definitely established:

That PLAT-O's wide speed range and ready adaptability to all types and sizes of aggregates meet every requirement for *accurate sizing.*

That PLAT-O's fast conveying action, flat screening angle and high speed vibrating mechanism meet every requirement for *maximum tonnage.*

That PLAT-O's rugged, all steel welded construction and simple, trouble-free design meet every requirement for *dependable performance.*

That PLAT-O's record on all of these points meets every requirement of your job.

Most models of PLAT-O Vibrating Screens are still available for immediate delivery. Write today for specifications and prices.

DEISTER MACHINE COMPANY, Fort Wayne 4, Indiana

CONSOLIDATED CEMENT CORPORATION, Chicago, Ill., had a net profit of $110,931 for the six months ended June 30, 1943, as against $175,158 for a like period in 1942. Net sales for the first six months of 1943 were $1,121,437 as compared with $1,366,-562 for a similar period in 1942.

•

DIAMOND PORTLAND CEMENT CO., Middle Branch, Ohio, had a net income of $63,904 for the year ended December 31, 1942, after charges and taxes, which compares with $93,098 for the year ended December 31, 1941.

•

SCHUMACHER WALL BOARD CORPORATION, Los Angeles, Calif., reports for the year ended April 30, 1943, net profit of $158,690. This compares with a profit of $260,297 for a similar period ended April 30, 1942.

•

LONE STAR CEMENT CORPORATION, New York, N. Y., showed a net profit of $681,369, after charges and provision of $899,167 for taxes, for the quarter ended March 31, 1943. This compares with a net profit of $708,368 for the quarter ended March 31, 1942, when federal taxes aggregated $923,-966. Sales for the first quarter in 1943 were $7,251,363 as against $7,-354,126 for the first quarter in 1942.

•

ALPHA PORTLAND CEMENT CO., Easton, Penn., had a net profit of $834,-828, after charges and provision of $680,454 for taxes and $200,000 for contingencies, for the 12 months ended June 30, 1943. For the 12 months ended June 30, 1942, the net profit was $1,288,759 after federal tax provision of $637,821. Sales for the year ended June 30, 1943, amounted to $9,893,375 as against $10,393,435 for a like period ended June 30, 1942.

•

NORTH AMERICAN CEMENT CORPORATION reports for the 12 months ended June 30, 1943, a net loss of $246,133 after taxes, depreciation, depletion and interest, but before profit on bonds purchased, comparing with a net profit of $150,403 for the 12 months ended June 30, 1942. The company has called for redemption on September 1, its outstanding series 6 percent notes due September 1, 1948.

•

NATIONAL GYPSUM CO., Buffalo, N. Y., has reported a net income of $442,658 for the six months ended June 30, 1943, which compares with $401,053 in the comparable 1942 period.

Amsco Welded Crusher Mantles
Help Relieve War Time Scarcity

From an Eastern welding equipment distributor comes the following report:

Worn manganese steel crusher mantles at a Virginia crushing plant were rehabilitated by Amsco conservation welding. One-inch diameter Amsco nickel-manganese steel filler bars were swedged by hand, after heating to a red heat, to match the contour of the mantle and then were tacked on two inches apart, using 3/16" and 1/4" Amsco nickel-manganese steel electrodes. The space between the applicator bars was then partly built up with the same rod. All the welds were peened vigorously.

•

W4—Crusher mantle, 128" at large end, built up with Amsco Nickel-Manganese Steel Electrodes and Amsco Filler Bars.

A388—Dull, inefficient dipper teeth made sharp at small cost with Amsco Repointer Bars and a little Amsco Nickel-Manganese Steel Welding Rod.

The user asserts that the rebuilt mantles lasted as long as new ones, which is credited to the formula of the welding materials and work-hardening from thorough peening. This is another case where build-up welding has restored essential parts to "good-as-new" condition while saving new metal badly needed elsewhere. This work would be justified under war-time conditions even if more expensive than new castings, but usually the cost of reclamation is less.

Amsco nickel-manganese steel welding rod, filler bars and shapes are also conserving metal in reclaiming such castings as crusher jaws and concaves, dipper lips and teeth, and other ferrous parts which are subjected to severe abrasion.

Write for Bulletin 941-W, describing the complete line of Amsco Welding Products.

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL., NEW CASTLE, DEL., DENVER, COLO., OAKLAND, CALIF., LOS ANGELES, CALIF., ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

AMERICAN Brake Shoe COMPANY

Two Reports on Industry Committee 59, U. S. Dept. of Labor

COMMITTEE 59, U. S. Department of Labor, Wage and Hour Division, is the Committee for the Stone, Clay, Glass and Allied Industries, representing the public, employers and organized labor. It includes some members from the rock products industries which are lumped in that category — sand, gravel, crushed stone, lime, talc. A part of its personnel was given on p. 35 of the July issue of ROCK PRODUCTS under a misnomer—"W.P.B. Appointments."

The committee met in New York City, May 27, to fix a minimum hourly wage for this group of industries. Here are two interesting versions of the meeting which are submitted here without comment:

We Own and Offer

NEW & USED EQUIPMENT

SPECIAL

1—ROTARY CONVERTER — Westinghouse, 1000 KW, Serial No. 1930945, 250 volts D.C., complete with panel board.

1—TRANSFORMER—Westinghouse, 1100 K.V.A., Serial No. 463866, 3 Phases.

1—TURBINE — Westinghouse, 100 HP, 2700 RPM, direct connected to Westinghouse reducing gear, ratio 3 to 1.

1—ANDERSON 150 HP DIESEL UNIT —with Westinghouse Generator complete with all auxiliaries. Late model. Fine condition.

AGITATORS

23—For 12'x12' Tanks.

AIR COMPRESSOR

1—COMPRESSOR — Ingersoll-Rand, Type XB, cylinders, 11"x14", capacity 582 cu. ft., driven by 104 HP motor, complete with Harris system vacuum and pressure tank control and receiver tank, 3'6"x7'.

BLOWERS AND FANS

2—FANS—60" Sturtevant.
1—BLOWER—Clarage No. 50.
1—FAN—Clarage, Type SF, 60".
2—FANS—Raymond Mfg. Co. Size No. 11.

BUILDINGS — STEEL

1—80'x120'x20', steel.
1—45'x220', Steel Structure.
Etc.

DERRICK AND CRANE

1—DERRICK—Steel Guy Derrick, 110 ft. mast, 90' boom, equipped with Clyde three-drum hoist, General Electric 84 HP, 230 Volt D.C. totally enclosed motor.
1—JIB CRANE—Brownhoist, No. 5991, 45' arm, capacity 4500 lbs.

DRYER-ROTARY

1—3½x44 ft.

KILNS AND COOLERS

Various dimensions.

ELEVATORS AND CONVEYORS

2—ELEVATORS—42"x16"x75', steel casing, 9"9"x7".
1—ELEVATOR — 48"x15"x22', steel case, 6"x7"x9" buckets.
1—ELEVATOR — 48"x15"x30', steel case, 6"x7"x9" buckets.
1—ELEVATOR — 48"x18"x30', steel case, buckets 14"x6"x11".
2—ELEVATORS—48"x18"x60', steel case, buckets 14"x6"x11".
1—ELEVATOR — 48"x18"x28', steel case, buckets 14"x6"x11".
1—BUCKET ELEVATOR — 36"x12"x40', steel case, bucket 6"x8"x10".
1—BUCKET ELEVATOR — 18"x45"x50', steel case, buckets 14"x6"x11".
1—DRAG PAN CONVEYOR — pan, 14"x10"x8", complete with 12" pitch, head and tail sprockets and gear speed reduction, 35 feet long.
6—SCREW CONVEYORS—12"x300' long, steel case.
1—SCREW CONVEYOR—8"x12', steel case.
1—SCREW CONVEYOR — 12"x35', steel case.
1—SCREW CONVEYOR — 12"x160', steel case.
2—SCREW CONVEYORS — 12"x110', no casing.
1—SCREW CONVEYOR — 12"x30', steel casing.
1—SCREW CONVEYOR — 12"x60', steel case.
1—SCREW CONVEYOR — 12"x35', wood case.
3—BELT CONVEYORS — 30' long, 24" wide, bag carrier type.

FEEDERS

2—BAILEY FEEDERS—Type No. 2, complete with steel hoppers, 8½ dia. x 12 ft. cone bottom, 12" screw conveyor, enclosed, 30' long bucket elevator, 36x12x25, steel housing.
2—FEEDERS — Ferris Wheel Type, 4'6" wheel, 7x8x10-in. buckets, steel case.

FLOATING EQUIPMENT

1—DREDGE — Manufactured by the American Steel Dredge Co., 64'x30'x6' Steel Hull complete with all auxiliaries ready to operate, locomotive type boiler, Union Steam Company pump, Pyle National Company Generator, Hoist, Compound Engine 8"x10" cylinders, 2—28"x15" Chain Drums, Bull Gear, Pinion and Brake for each drum, 200 ft. ⅝" Chain on Drums, 100 ft. ⅝" Chain spare, 2—8"x15" Nigger Heads "Service Work", Spuds—1 each side Rack 30' long, 3" pitch, 7" face, 30" section of rack, separate steam engine for each spud, compound engine 5"x8" cylinders, gear to counter-shaft, worm gear to spud pinion, worm gear 30", pinion 6", boom 60' long, 11"x12" box type, bucket 1¼-yd. Hayward.
1—TUG—Manufactured by the American Steel Dredge Co., 40'x13'x6', ¼" Steel Plate Hull, Boiler and Engine.
3—SCOWS—Steel construction, 58'x16'x6', built by Johnson Bros.
1—MACHINE BOAT — Johnson Bros., 54'x17'x6'6", complete with dump hopper, cutter, scraper, elevator and loader. Driven by compound steam engine.

GRINDING EQUIPMENT

1—CLAY MILL—American Clay Machinery Company, Dry Pan, 9' diameter, with 2—48"x10" grinding stones, cast iron construction.
1—PUG MILL—15" diameter x 8½', with beaters.
3—TUBE MILLS — 5½x20 ft., F. L. Shmidt Co.
3—TUBE MILLS—5'x20', F. L. Shmidt.
1—TUBE MILL—5x22 ft., F. L. Shmidt Co.
3—KOMINUTERS—No. 66, F. L. Shmidt.
1—RAYMOND MILL—4-roll.
1—RAYMOND MILL—5-roll.

SCREENS

4—SCREENS—4'x5', W. S. Tyler Co. Hummer Screens, complete with generator.
2—ROTARY SCREENS—18"x8'.

TRUCK SCALE

1—SCALE—Howe Truck Scale, capacity 40,000 lbs., platform 9'x20', with Pilse ticket marker.

WEBBER EQUIPMENT CO.

New and Used Equipment

17 EAST 45TH STREET NEW YORK, N. Y.

MU. 2-6511

by J. R. BOYD

Administrative Director, National Crushed Stone Association

(In Letter to Members—with Some Editorial Changes)

At the meeting of the committee and after extensive debate in which the labor and public members indicated a favorable attitude toward the immediate establishment of the 40-cent minimum, effort was made to submit a motion for not advancing the effective date of the 40-cent minimum in those states which showed a current practice of paying less than 40 cents hourly. The motion was ruled out of order on the ground that the statute did not permit of wage classifications based exclusively on geographical differentials.

A motion was then submitted by a representative of employers for the nation-wide application of a 35-cent minimum rate for his industry, with no reduction in minimum wage practices wherever 40 cents or more was being paid. This motion was amended by a proposal submitted by another representative of employers that the same basis also be applied to his industry. Representatives of other industry employers proposed similar amendments as to their respective industries. The motion was lost, the labor and public members and one employer member voting in opposition.

The majority of the committee thereupon recommended to the Administrator that a 40-cent minimum wage be established for all of the industries defined as being covered by the stone, clay, glass, and allied industries. Under the law it is possible for the Administrator to issue such an order after public hearing, thus advancing the effective date of the 40-cent minimum. In the absence of such an administrative order, the 40-cent minimum, under the statute, would become effective on October 24, 1945.

by WM. SCHOENBERG

General President, United Cement, Lime and Gypsum Workers International Union (A. F. of L.). (In July issue of the "Voice of the Union Cement, Lime, Gypsum and Allied Workers"—with some irrelevant omissions.)

The seating of the delegates was in a horseshoe form, with the public representatives sitting at the head of the table, and on each side down the line labor and employers' representatives facing each other. In

the rear of the hall was the public, composed largely of employers directly interested in the industries to be taken up for discussion, although there were four labor representatives in this group.

* * * * * * *

It was interesting to note that most of the employers came from southern states * * *.

Spectators Invited to Testify

As soon as the committee was lawfully constituted, the presiding officer, a public member, asked the public visitors whether they desired to make any statements or file any briefs or depositions, but to the great surprise of the committee, no one of the public visitors present desired to be heard; therefore one of the labor representatives moved that inasmuch as none of the spectators had any statements to make the committee resolve itself into an executive session. This motion to our further surprise was unanimously adopted and thereafter a recess was taken of a few minutes and upon re-assembling it was apparent that the employers' representatives on the committee and the spectators of the public, except the labor representatives who were there as spectators, had conferred and as a result, the motion was made to reconsider the action of going into executive session. This caused considerable debate. The labor members of the committee were perfectly willing to accord the spectators an opportunity to be heard, but no one desired to be heard—no one cared to address the committee. What they really desired was to stay in the hall and either listen or partake in the deliberations of the committee. This the labor members opposed, and as a result the public spectators withdrew.

The discussion during all day was most illuminating and interesting. Here were the labor people acting unitedly, forgetting for a while their family difficulties whether they were A. F. of L. or C.I.O. They were in reality and in fact a perfect unit from the beginning until the end of the sessions. The employers were not quite so harmonious among themselves. It was rather amusing to listen to the arguments of the employers. Each of them professed to be in favor of at least 40 cents per hour but claimed that their neighbors, who in reality are their competitors, might be hurt by compelling them to increase their minimum wage rates to at least 40 cents. In another case, an employer was not quite so consistent with himself, as he talked against the 40 cents but in the final ballot cast his ballot for it. Another employer during the discussion stated that his plant now was organized and that he was well pleased with the results that unionization brought to his plant, and that he was now paying a minimum rate of 41 cents per hour; but in the voting he voted against the 40 cent minimum wage rate.

During the day there were several intercessions regarding parliamentary law. It was interesting to note the four international presidents present engaging the presiding officer, a university professor, in discussion about the application of Roberts Rules of Order; however, on a whole it was a profitable and interesting meeting which received the ardent attention of the labor representatives.

Gravel Contract

THE COOLEY GRAVEL CO., Sampsell, Mo., has the contract for regraveling highway 116, consisting of 10 miles of roadway between Polo and highway 69. This company also has the contract for the highway between Palo, Mo., and Braymer.

TOMORROW'S SPECIFICATIONS WILL INCLUDE NAYLOR LIGHT-WEIGHT PIPE

POST-WAR REQUIREMENTS CALL FOR THESE NAYLOR ADVANTAGES

Always accurate in diameter.
Concentric ends match correctly.
Easier to install.
Holds true cylindrical form.
Stays tight and leakproof.
Stronger—safer.
High salvage value.
Light weight saves steel.
Cuts maintenance costs.
Saves money.
Sizes: 4" to 30" in diameter—all types of fittings, connections and fabrications.

No question about it! Naylor Pipe with its exclusive Lockseam Spiralweld structure has what it takes to do the job that will be required when peace comes.

The outstanding performance of this distinctive lightweight pipe on the battle fronts points the way to the solution of many mine-piping problems in the post-war period.

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Naylor
LOCKSEAM SPIRALWELD PIPE

NAYLOR PIPE COMPANY
1237 East 92nd Street
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Perforated
METAL SCREENS
ANY SIZE - ANY SHAPE
ANY METAL - ANY PERFORATION
H & K screens are produced to meet the most exacting specification and to serve well and long. Quality and workmanship are given first consideration.
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★ and a Fellow Worker

BY sharing your copy of ROCK PRODUCTS each month. Pass it along to some other man inside or outside your organization who can read it with profit.

OUR government asks publishers to save paper wherever possible and we are doing all we can to conform but you can help also by making the information ROCK PRODUCTS contains available to as many persons as possible.

WE will, of course, continue to send ROCK PRODUCTS to all regular readers.

SHARE YOUR ROCK PRODUCTS

Washington Doings and Regulations

SOME interesting regulations have come out of Washington, D. C., in recent weeks.

Mining Machinery Manufacturers' Difficulties

O.W.I., TCS-269: Manufacturers of mining machinery are not meeting their schedules of production because of difficulties in getting component parts, it was revealed last week at a meeting of the Mining Equipment Industry Advisory Committe of the War Production Board.

Production schedules have been frozen 90 days ahead and no changes in the order of production approved by WPB will be permitted in any month.

Some members of the industry also cited labor shortages as well as the components difficulties as interfering with the processing of repair jobs.

Discussion revealed that no appreciable difficulties are being experienced in obtaining controlled materials. But the fear was expressed by committee members that unless something can be done to make available the essential equipment production and repair will fall off in the last half of this year.

Defluorinated Phosphate Price

O.P.A.—T-1045, Amendment 186 to supplementary Regulation 14 to G.M.P.R.: A maximum price of $34.25 per ton, f.o.b. producers plant is estimated by the O. P. A. for sale of defluorinated phosphate—used as a substitute for steamed bone meal in animal feeding. This new ceiling represents an advance of $4 per ton over the maximum price for this product as established under the general March, 1942, freeze.

Maximum Prices on Basic Refractories

O.P.A., M.P.P. Part 1362, R.P.S. 75 Revocation, Ceramic Products; Dead-Burned Grain Magnesite; M.P.R. 416, Basic Refractory Products, including Dead-Burned Dolomite: Maximum prices effective on and after July 3. The base list prices at the producers' shipping point for standard 9-in. straight basic refractory brick are shown below.

The base list prices of all basic refractory brick with the exception of standard 9-in. straights shall be calculated as follows: The maximum prices shall be determined by the use of the pricing formula or formulae

(Continued on page 150)

BASIC REFRACTORY BRICK BRANDS AND PRICES

Type	Manufacturer and brand			
	Harbison-Walker Refractories Co.	General Refractories Co.	E. J. Lavino & Company	Price per net ton
Burned chrome	H-W Chrome Brick	G. R. Co.	Lavino	$54.00
Unburned chrome-magnesite.	H-W Chromex	Ritex	U. B. K.	54.00
Unburned magnesite-chorme.	H-W Magnex	Ritex	Kembond D. C.	65.00
Burned magnesite	H W R C O magnesite brick	G. R. Co.	(1) Lav.-Puddler (2) Lavino	76.00 76.00
Burned low-iron periclase	H-W periclase brick	G. R. Co.	(1) Lofero (2) Onival	79.00 79.00
Unburned magnesite (chrome-free).	H-W Magnex	Ritex	(1) Kembond D. (2) Kembond 90.	71.00 71.00
Unburned chrome-magnesite.		Unbrnd. Ritex-40.		59.00
Burned chrome magnesite:				
H-W Chromex B (Harbison-Walker Refractories Co.)				61.50
Kromag (E. J. Lavino & Company)				61.50
Burned Ritex—40 (General Refractories Co.)				66.50
H-W:				
(Harbison-Walker Refractories Co.) Standard Rounds				81.00
Metalkase magnesite:				
Standard Straights and Keys				111.00
Improved (Steel 3 Sides) H-W Magnex				65.00
Improved (Steel 3 Sides) H-W Magnex chrome-free				71.00
Steelklad brick:				
Wall Magnesite (General Refractories Co.)				65.00
Roof Magnesite (General Refractories Co.)				65.00
Roof Chrome (General Refractories Co.)				65.00
H-W Forsterite:				
(Harbison-Walker Refractories Co.)				50.00

Make wire rope last . . . keep it on the job

Sharing your wire rope with the armed forces doesn't mean going without; it just means taking *care* of what you have. For example, inspect it often. Lubricate when indicated. Operate at capacity, but don't overload.

When you must replace a rope, get *Preformed* Yellow Strand for heavy-duty quarry jobs. It's strong, flexible, highly resistant to kinking and fatigue—qualities that result in long rope life. Specify *Preformed* Yellow Strand for hoist and drag lines on your dragline machine . . . for holding and closing lines on clam shells . . . for hoist and swing lines and as rack and crowd ropes on power shovels. B & B engineers will gladly help you *choose* the right rope and *use* it right.

Broderick & Bascom Rope Co., St. Louis

Branches: New York, Chicago, Houston, Portland, Seattle
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YELLOW STRAND
PREFORMED
WIRE ROPE

B & B's Army-Navy "E" Flag, Three Times Won, Means that . . . We Serve the Government as We Serve Industry: with Determination that Our Entire Energies and Resources Shall Help to Win the War.

You Get MORE Material

through a

DIAMOND VIBRATOR

You CAN'T Choke It!

Big capacity—fast action—thorough separation—freedom from trouble—those are the results you want in a vibrating screen. DIAMOND gives them to you—doubly sure. Proper placing of the eccentric gives all-over vibration—WITHOUT transmission to frame. Rubber mounted roller bearings and remarkable balance assure smooth, positive action. Note space between decks—it's a choke-proof screen! Raised center works material over ALL screen surface. Screen cutting is practically eliminated by the DIAMOND method of clamping. Write today for new Equipment Bulletin D-42-V.

Jaw Crushers
Roll Crushers
Hammermills
Screens

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Conveyors
Bins—Feeders
Portable & Stationary Plants

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ESTABLISHED 1880
AND THE MAHR MANUFACTURING CO. DIVISION

1800 SECOND ST. N. **MINNEAPOLIS 11, MINN.**

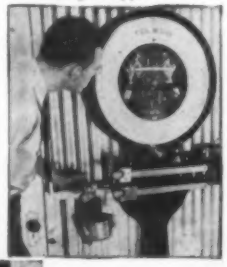
[SC]² PRECISION CONCRETE CONTROL

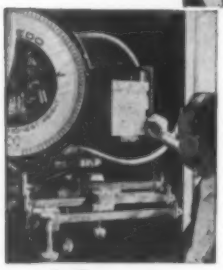
IMPROVES QUALITY
REDUCES COST

Attaches to your Weigh Hopper

Moisture Meter

The only unit capable of determining moisture content in ONE minute.





Compensator

Delivers correct DRY weight of aggregates and ADDED water. Makes a graph record of EVERY BATCH.

[SC] CONTROL produces remarkable uniformity. Is always approved by concrete engineers. Has definite sales value. Write for our booklet "PROFITS IN CONCRETE."

SCIENTIFIC CONCRETE SERVICE CORP.
McLachlen Bldg., Washington, D. C.

Washington Doings

(Continued from page 148)

used by each manufacturer in October, 1941, to determine the prices at that time of such items. The values given to the factors used in said formula shall be no higher than the highest values given to the same factors in October, 1941. Prices under said formulae and the method used in computing said factors shall be the method used in October, 1941. The pricing formula of each manufacturer is filed with the Office of Price Administration, and copies thereof are available to inquirers.

SEC. 4.5. *Transportation charges.* The transportation charges which may be added to the base list price at the destination is the charge for delivering the particular quantity of basic refractory brick from the basing point that has the lowest freight rate to the destination at the time of shipment. The basing points are Plymouth Meeting, Penn.; Chester, Penn.; and Baltimore, Md.

SEC. 4.6. *Packaging charges.* There may be added to the maximum prices of basic refractory brick computed in accordance with section 4.3 the following charges for domestic and foreign packaging shown below.

Dead-Burned Dolomite

SEC. 5.2. *Definitions.* (a) "Dead-burned dolomite" means roasted refractory dolomite, in granular form, treated or untreated, clinkered, and burned to a dead state.

(b) "Short ton" means 2,000 lbs. net weight.

(c) "Carload quantity" means a shipment of basic refractory products, the weight of which is sufficient to constitute a carload shipment or on which the charges would be collected at the carload rate under the tariffs of the railroad furnishing the car.

	9 in. Straights NT	9 in. Sizes NT Shapes Per	M 9 in. equivalent
Crates			
Domestic crates (30—9 in. equivalent)..	$6.00	$7.00	$37.50
Export crates with straw or paper.....	6.00	7.00	37.50
Export crates with excelsior.....	7.00	8.00	42.50
Hardwood barrels with sawdust.....	10.00	11.00	60.00
Skids			
About 350—9 in. equivalent.....	5.00	5.75	32.50

ONE EYE ON THE FUTURE

STEAM—GASOLINE—DIESEL LOCOMOTIVES—ELECTRIC OR MECHANICAL DRIVE

STEAM—GASOLINE—DIESEL LOCOMOTIVES—ELECTRIC OR MECHANICAL DRIVE

Most business men are doing a lot of solid thinking against the day when hostilities cease. Nor are they neglecting for an instant the grave responsibilities of war. They drive themselves in support of increased production. They are positive, dependable units in the unbeatable aggregate we call Democracy. The time they give to post-war planning simply adds to the fervor of their war service because it makes them see more vividly the stakes for which we are fighting. No wonder many are giving thought NOW to the superb performance of Better-Built Davenports on these bigger haulage operations that merely await the passing of a little more time—until VICTORY.

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DAVENPORT LOCOMOTIVE WORKS
A DIVISION OF DAVENPORT BESLER CORPORATION DAVENPORT IOWA

UNIVERSAL SCREENS and "UNIVIBE" RIDDLES

Complete line of—
Tried, Proved and Guaranteed Vibrating Screens. Since 1919, the BEST in screening equipment at the LOWEST COST.

NEW! 32-page Catalog on Screens and Screening. Just ask for Catalog No. 107.

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RACINE — WISCONSIN

HAYWARD BUCKETS

WON'T QUIT OR CAUSE TIME OUT

A Hayward Bucket keeps the job.. going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD COMPANY
202-204 Fulton Street
New York, N. Y.

SEC. 5.3. *Plant base prices.* The plant base price of dead-burned dolomite shall be:

Plant base	Price per short ton	
	In bulk	In heavy paper bags
Woodville, Ohio	$9.30	$15.00
Millersville, Sandusky Co., Ohio	9.30	15.00
Narlo, Seneca Co., Ohio	9.30	15.00
Maple Grove, Ohio	9.30	15.00
Bettsville, Ohio	9.30	15.00
Gibsonburg, Ohio	9.30	15.00
Martin, Ohio	9.30	15.00
Millville, West Virginia	9.30	15.00
Billmeyer, Lancaster Co., Pa.	9.30	15.00
Williams, Pa.	9.30	15.00
Blue Belle, Pa.	9.30	15.00
McCook, Illinois	9.40	15.00
Thornton, Illinois	9.40	15.00
Dolly Siding (Bonne Terre), Missouri	9.50	15.00

Transportation charges may be added as in Sec. 4.5 (the lowest rate to destination).

Disposal of Surplus Government-Owned Property

O.W.I.—2155; War Department—72854: New procedures have been developed for disposing of surplus, government-owned industrial property. The new procedure authorizes Army disposal of industrial property for direct war use at any time by sale or lease to war contractors; by transfer to other War Department components or to the Navy; and by transfer to the American Red Cross and the United Service Organizations.

Rental Prices for Equipment

O.P.A., M.P.R. 134; Amendment No. 9:

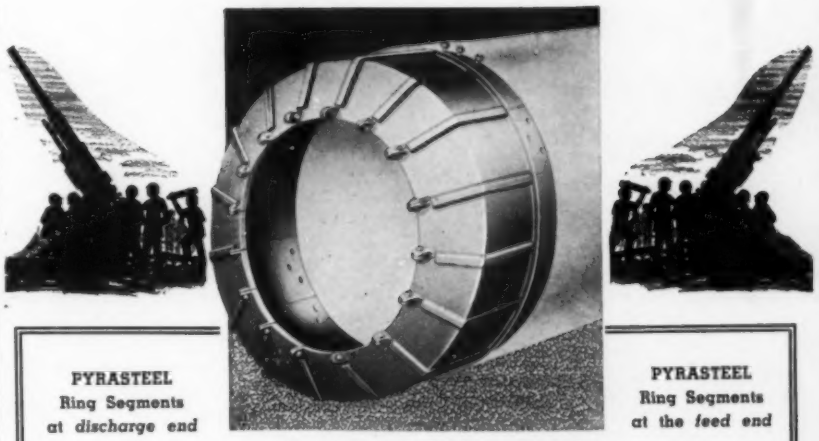
Nation-wide rental ceilings on dump trucks are established in an action generally revising the price regulation dealing with construction equipment rentals and service charges.

Major changes contained in Amendment No. 9 to Maximum Price Regulation 134 (Construction and Road Maintenance Equipment Rental Prices and Charges for Operating and Maintenance or Repair and Rebuilding Charges) include adjustment of rental rates which experience showed were too high or low.

Cement Price Determination

O.P.A., M.P.R. 224:

Prices which "would have been" charged during base period. In determining what price "would have been" charged to a purchaser during the base period, March 1-15, 1942, the past practices of the seller's competitors in reference to pricing, freight allowances, etc., during the base period need not be considered, unless the seller's practice during the base period was to base his prices



PYRASTEEL Ring Segments at *discharge* end

PYRASTEEL Ring Segments at the *feed* end

FEED END INSTALLATION

PYRASTEEL Protection at *both* ends

You can't afford to risk kiln-end "burnouts" that cause serious shut-downs and costly repairs. Remember that PYRASTEEL Kiln-Ends are available for both the *discharge and the feed ends* of your rotary kiln. They give continuous service at high temperatures, and outlast ordinary castings many times over . . . as proved in scores of installations where PYRASTEEL is giving satisfactory results. *Write for Bulletin of this* "Sure-Fire" heat-resisting alloy.

CHICAGO STEEL FOUNDRY COMPANY

PYRASTEEL — CHICAGO — EVANSTEEL

Keep moving . .

. . . the material from stockpile to crusher . . .

***with Brooks* LOAD LUGGER**

The unit fits on any truck chassis and utilizes 5 to 10 dump buckets. Ask for Catalog 44.

For maintaining a steady flow of quarry stone to the crusher . . . for distributing crushed rock to roadways or agstone to farm fields . . . for hauling sand or gravel . . . for transporting cement, asphalt or other materials to highways or construction jobs . . . you can use the LOAD LUGGER with a big saving in trucks, in time, in maintenance and in manpower.

808 Davenport Road Knoxville, Tenn.

Distributors in All Principal Cities

Brooks EQUIPMENT AND MFG. CO.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

...the Correct Rope for your equipment

made to meet the needs of

ROCK PRODUCTS OPERATORS

- PREformed
- Internally Lubricated
- Made from selected steels
- Made by craftsmen with years of experience

656-R

MACWHYTE COMPANY

2949 Fourteenth Ave., Kenosha, Wis.

MILL DEPOTS: New York, Pittsburgh, Chicago Ft. Worth, Portland, Seattle, San Francisco

Distributors throughout the U. S. A.

MORE YARDS

at Less Cost

It costs but a few cents per yard to dig, haul and place materials with a SAUERMAN Power Scraper or Slackline Cableway. The low cost and large capacity of these machines is proved daily on hundreds of digging and stockpiling jobs.

SAUERMAN Machines are designed in suitable sizes and types for the requirements of every long range material handling job. Each machine, whether large or small, offers the greatest possible economy of power and labor.

Write for Catalog

SAUERMAN BROS., Inc.

530 S. Clinton St., Chicago 7

Washington Doings

(Continued from page 150)

on those of the competitor. The fact that a past price "would have been" abnormally low or abnormally high during the base period should not be considered a factor, unless the conditions responsible for such abnormal price were duplicated substantially during the base period.

Contract prices during the base period. In September, 1941, a manufacturer contracted to sell cement to a dealer at $2.37 a barrel, the contract to expire in May, 1942. In November, 1941, the manufacturer increased his price 10 cents a barrel and notified the dealer of this new price, but continued to charge him $2.37 in accordance with the contract. In March, 1942, when the freight rates advanced 4 cents per barrel, the manufacturer notified the dealer of this advance and quoted him a price of $2.51 a barrel, but continued shipments at the contract price of $2.37. The contract expired in May, 1942. Pursuant to Section 1346.104 (a) the manufacturer may now charge this dealer $2.51 a barrel. This section provides that the maximum prices to be charged under the Regulation shall be computed in accordance with what the price was or would have been during the base period, March 1 to 15, 1942, taking into consideration the "basis for the prices, pricing practices, freight practices, trade discounts . . . most favorable to purchasers in effect, published, listed, or quoted by the seller during the period March 1 to 15, 1942." This section permits the manufacturer to determine a maximum price for this purchaser and other purchasers to whom the manufacturer sold under similar contracts during the base period, at the price which the manufacturer quoted or would have quoted the particular purchaser during the base period had there been no existing contract.

Commissions. A manufacturer selling cement outside his normal market area at the maximum f.o.b. mill prices set forth in Section 1346.104 (b) (1) (ii), may not add any dealer's commission, regardless of any relationship between the manufacturer and the dealer located outside the manufacturer's normal market area. Any commission or selling expense incident to such sale must be paid by the seller out of his return from the sale of the cement at the maximum price.

Becomes President

S. EDWARD WININGER, president of Wininger & Selby, Inc., New York, N. Y., which has purchased control of The Nicholson Co., Inc., is also president of the latter concern. PAUL N. RYLANDER is vice-president; CLIFF SCOTT, secretary, and CHARLES A. SELBY, treasurer.

Industrial Sands

Production of glass sand in 1942 increased four percent in quantity and six percent in average value, with an output of 3,622,487 short tons averaging $1.87 a ton compared with 3,475,111 tons at $1.76 a ton in 1941. Leading producing States in order named were Illinois, West Virginia, Pennsylvania, New Jersey, and Missouri.

Molding sand production increased 14 percent in tonnage and 12 percent in average value, with an output of $8,255,991 tons averaging $1.30 a ton compared with 7,246,081 tons at $1.16 a ton in 1941. States leading in production were Illinois, New Jersey, Michigan, Ohio and New York.

Decreasing approximately 20 percent in quantity and increasing 22 percent in average value, production of grinding and polishing sand totaled 806,878 tons, averaging $1.69 a ton compared with 1,001,814 tons at $1.39 a ton in 1941. Leading producing States were Illinois, Pennsylvania, Michigan, New Jersey, and Missouri.

Fire or furnace sand production increased approximately 13 percent in quantity and 22 percent in average value, totaling 368,465 tons with an average value of $1.34 a ton compared with 325,083 tons at $1.10 a ton in 1941. States leading in production were Indiana, Ohio, Illinois, Pennsylvania, and New Jersey.

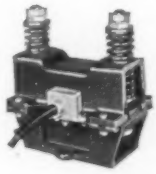
Engine sand production increased approximately 27 percent in quantity and five percent in average value, totaling 2,559,008 tons with an average value of 68c a ton compared with 2,022,782 tons and an average of 65c a ton in 1941. Pennsylvania, West Virginia, Nebraska, Alabama, and Illinois were the leading States.

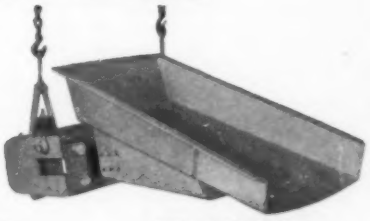
Filter sand production decreased 33 percent in tonnage and increased two percent in average value, the output totaling 176,833 tons averaging $1.26 a ton compared with 263,966 tons averaging $1.23 a ton in 1941. Virginia, New Jersey, Connecticut, Minnesota, and Arkansas are the leading producing States.

Miscellaneous sands decreased 16 percent in tonnage and aproximately 10 percent in average value, totaling 1,698,134 tons averaging 79c a ton compared with 2,022,604 tons at 72c a ton in 1941. This sand is used mainly for silicate of soda, golf traps, icy sidewalks, fertilizer, etc.

Your Material Handling Problems Simplified with

SYNTRON

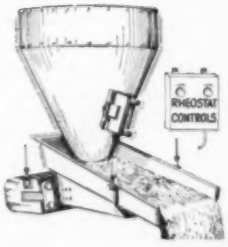




ELECTRIC VIBRATORS

VIBRATING FEEDERS

with adjustable power, on those troublesome bins and hoppers to keep their contents agitated and free-flowing. Little 4-lb. models—up to BIG 500 lb. sizes.



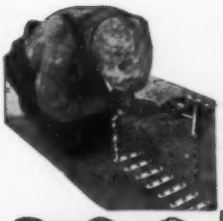
under those bins and hoppers to regulate their discharge by rheostat control of rate of flow.

Capacities from ounces to TONS per hour.

No Motors — Gears — or other Moving Wearing Parts
Low Initial Cost — Low Operating Cost

Illustrated and described in Catalog No. 435

Syntron Co., 450 Lexington Ave., Homer City, Pa.

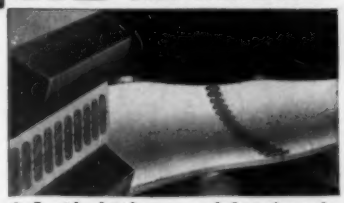


Keep your conveyor belts going with FLEXCO

HD BELT FASTENERS

• **FLEXCO H D RIP PLATES** are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.

• **FLEXCO H D BELT FASTENERS** make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.



• Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.

Bulletin F-100 shows exactly how to make tight butt joints in conveyor belts with Flexco HD Belt Fasteners. Also illustrates step by step the latest practice in repairing rips and putting in patches.

Write for your copy

FLEXIBLE STEEL LACING COMPANY
4884 Lexington St., Chicago

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

GOOD NEWS

You Can Now Buy NEW LEADER Truck Body Type

Lime Spreaders

Without Triple AAA Purchase Certificates

New, improved New Leader Lime Spreaders embody latest improvements, are much heavier in construction and reinforcement . . . built to stand hard usage . . . Can now be purchased with extra-heavy duty pintle type conveyor chain . . . positive-feed, self-unloading spreader will spread wet or dry lime uniformly from 30 to 45 Ft. in width.

Write today for latest catalog.

HIGHWAY EQUIPMENT COMPANY, INC.

Manufacturers of the World's Most Complete Line of Spreaders, including lime spreaders, sand and cinder spreaders, chip rock, clay and dirt spreaders.

CEDAR RAPIDS, IOWA, U. S. A.

Built to Give and Take

American Crushers are *built* to deliver the finished product at low cost . . . and they're built to stay on the job day-in-and-day-out, giving uninterrupted service.

Manganese steel rings or hammers strike the stone in suspension and shatter and distribute it before it reaches the breaker and grinding plates. A heavy alloy steel shaft gives them their powerful drive and SKF spherical roller bearings assure their smooth performance.

Let us show you how you can benefit by installing an AMERICAN. Write for information.

AMERICAN PULVERIZER CO.
1245 Macklind Ave. St. Louis, Mo.

Steel In Stock At RYERSON

• Steel for every type of maintenance, construction, or manufacturing. Bars, Alloy Steels, Plates, Structurals, Sheets, Shafting, Hollow Drill Rod, Tubing, Stainless, Bolts, Babbitt, Rivets, Wire, Tool Steel, etc., over ten thousand different kinds, shapes and sizes ready for shipment from our nearest plant.

Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Detroit, Cleveland, Cincinnati, Buffalo, Boston, Philadelphia, Jersey City

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service

EARLE C. BACON, Inc.

17 John St., New York, N. Y.

OBITUARIES

SAMUEL REID RUSSELL, explosives and blasting expert for E. I. du Pont de Nemours & Co., died at Easton, Penn., of a heart attack, on July 8. Few men in the quarry, mining and construction industries had a wider circle of genuine friends than Sam Russell; and he was a very loyal friend to all of them. He was one of the original seven founders of the

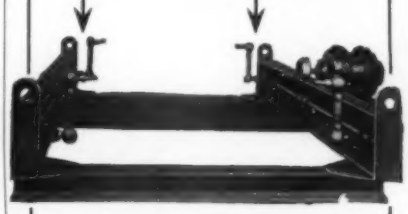
Samuel R. Russell

Manufacturers' Division of the National Crushed Stone Association and a regular attendant at all of the conventions of the Association.

Sam Russell was born in Belfast, Ireland, December 27, 1880, but came to this country as a boy with his parents, who settled in Troy, N. Y. He graduated in civil engineering at Rensselaer Polytechnic Institute in 1904 and joined the du Pont company in 1907 as a salesman in the Nashville, Tenn., office. He was soon transferred to the technical division of the company and in time became one of the country's foremost specialists in the use of dynamite. He was senior technician at the time of his death.

The foremost authority on all kinds of quarry and marine blasting, he perfected the method of tunnel blasting in open quarries. He supervised shots not only in this country,

CONTROL!



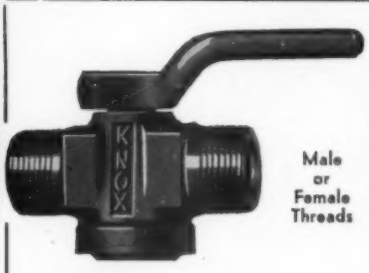
And Control Means Efficiency Always

This patented equalizer assembly connects the body to base frame and enables you to accurately CONTROL the circular throw of a SECO vibrating screen. You are always sure of getting maximum efficiency.

SECO

Vibrating Screens

Screen Equipment Co.



Male or Female Threads

Recognized Universally as the ULTIMATE in Valves and Couplings

KNOX MANUFACTURING CO.

818 CHERRY ST., PHILA., PA.

Since 1911 Producers of

KNOX

Valves-Couplings-Nipples-Clamps-Menders

but in Canada and South America. He often was called in as a consultant to the government on various projects, the deepening of Honolulu harbor being one of many, and one of particular interest.

Mr. Russell was the country's outstanding technician on precision dynamiting. One of his most spectacular accomplishments was the felling of a river dam which had been built upright on one bank. By accurate blasting of a retaining wall, he dropped the pre-constructed dam in a prepared base with only inches to spare on either side of the dam.

Whenever there was a big, dangerous blast to be made, Sam Russell was called on. He felled many an obsolete factory chimney within a narrow space between two buildings. He dynamited old bridges and made the debris fall exactly in a previously selected spot. During his lifetime he blasted loose literally billions of tons of rock. Recently he was called in as a consultant on another type of shot in Canada, which will involve the use of 2,300,000 pounds of high explosives in one charge. Once he even blasted a foundation in the middle of a power plant without the plant's dynamos shutting down for a minute.

Mr. Russell is survived by his wife, Adelaide C. Russell; two daughters, Mrs. Raymond Atkins of Lewes, Del., and Miss Adelaide Russell of Wilmington, Del.; and one son, Lt. Samuel R. Russell, Jr., of the United States Army.

•

ELIOT H. DOWNING, general sales manager, Pacific Portland Cement Co., San Francisco, Calif., and treasurer and director of the Pacific Coast Division of the Gypsum Association, passed away recently following a heart attack.

•

W. E. GAMEWELL, vice-president of the Memphis Stone and Gravel Co., Memphis, Tenn., for 15 years, was killed recently in an accident.

•

DR. HENRY P. TOBEY, formerly general manager of the Mountain Sand and Gravel Co., Great Barrington, Mass., died recently at the age of 53.

•

JAMES KOSTA SUMMERS, district manager of the New York office of the Vulcanite Portland Cement Co., until his retirement a year ago, died recently at the age of 63.

•

NICHOLAS J. LAUER, owner and operator of the Lauer Stone Quarry, Ottoville, Ohio, until his retirement a number of years ago, died recently at the age of 83.

PULVERIZERS for the reduction of Cement Materials, Limestone, **Agricultural Limestone,** Fire Clay and All Dry, Refractory Materials.

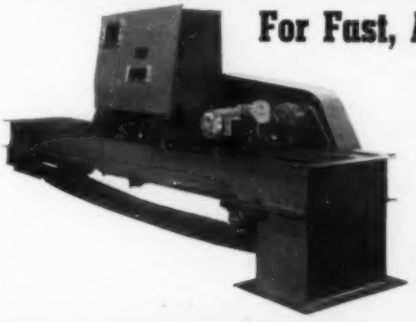
Capacities: 1 to 60 tons per hour — Finenesses: 20 to 350 mesh

BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

To Increase Capacities or Fineness of Present Grinding Plant—
To Reduce Power and Maintenance Costs—
To Insure an Absolutely Uniform Product—

***Use the* BRADLEY AIR SEPARATOR**



For Fast, Accurate, Continuous—

WEIGHING

FEEDING

PROPORTIONING

Raw Mix—Finish Grind

Use **FEEDOWEIGHT**

MERRICK SCALE MFG. CO. 168 AUTUMN STREET PASSAIC, NEW JERSEY

MANGANESE STEEL CASTINGS

for PULVERIZERS CRUSHERS ROLLS SCREENS

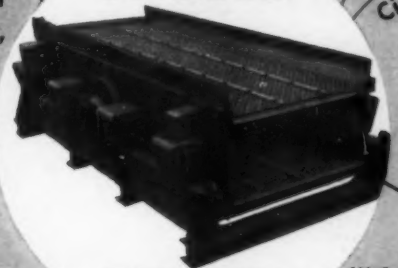
for SHOVELS DREDGES CRANES CONVEYORS

The Frog, Switch & Mfg. Co.

Established 1881 — CARLISLE, PA.

Record Tonnages in Screening Rock, Gravel & Ores Throughout the World

TY-ROCK



SCREEN

Full Floating Circle-Throw Action for Coarse and Medium Sizes

Write for Catalog No. 65

THE W. S. TYLER COMPANY CLEVELAND, OHIO

Manufacturers' News

Link-Belt Co., Chicago, Ill., has been awarded the Army-Navy "E" pennant for excellence in production of vital war materials at its Ewart plant in Indianapolis, Ind., and the plant's employes were presented with "E" pins symbolizing meritorious contribution to the war effort.

Sullivan Machinery Co., Michigan City, Ind., announces the appointment of Oliver J. Neslage as general sales manager. He has served as manager of the company's Mexico City, Joplin, Salt Lake City, and New York territories, which gives him a thorough knowledge of the mining, oil, construction, and industrial fields.

The Babcock & Wilcox Co., New York, N. Y., announces that the Augusta, Ga., plant of the company has been granted a renewal of the Army-Navy "E" award which was originally made on January 22, 1943. The renewal covers an additional period of six months. A star will be affixed to the "E" burgee that flies at the Augusta plant.

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., has been awarded the first prize for best business paper advertising campaigns, by the National Advertising Agency Network, for the third consecutive year. They were also awarded the second prize in the employe relations section.

F. W. Dodge Corp., New York, N. Y., has announced that Norman Jervis, who has been with the design department of Sweet's Catalog Service, a division of the company, during the past eight years, has been appointed catalog consultant in Sweet's New York offices. Mr. Jervis was previously connected with the publication "Textile World" and with the William Green Corp. in the direct mail field.

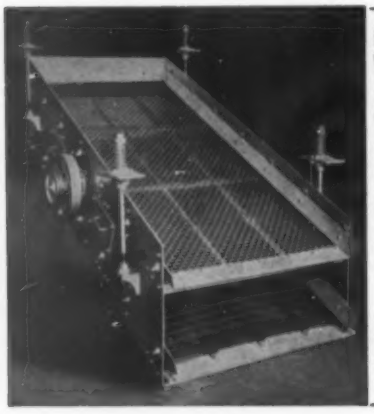
Presentation of Army-Navy "E" Award to the Link-Belt Co.

The B. F. Goodrich Co., Akron, Ohio, announces the retirement of Elmer R. Miller, manager of the molded goods department of the Industrial Products Sales Division, after 44 years with the company.

Universal Engineering Corp., Cedar Rapids, Iowa, has been awarded the Army-Navy "E" pennant for excellence in production of war equipment and the employes were presented with "E" emblems.

Blaw-Knox Co., Blawnox, Penn., has won the coveted Army-Navy "E" production award which was presented to the company for excellence in the production of war materials.

Elwell-Parker Electric Co., Cleveland, Ohio, has appointed C. B. Cook vice-president in charge of advertising, sales promotion and export sales. Mr. Cook has been identified with the company for the past 28 years and has been a director since 1941. He is a member of The Industrial Truck Statistical Association's Market Development Committee.



Denver - Dillon Vibrating Screen

The Denver-Dillon Vibrating Screen has been proved by over four years of service in numerous industries. Operators report definite reduction in screening costs. "Floating circle" principle requires less than half of the average power of other means of screening. Write today for new Bulletin No. 83-B8.

Denver Equipment Co.
1400 Seventeenth St.
Denver, Colorado
New York, N. Y., 50 Church St.
Salt Lake, Utah, McIntyre Bldg.
Chicago, Ill., 1005, 69 W. Wash.
Toronto, Ont., 45 Richmond St.
Mexico, D. F., Edificio Jalisco

McLANAHAN EQUIPMENT
for ROCK— SAND—GRAVEL

Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

McLanahan & Stone Corporation
Established 1835
Hollidaysburg, Pennsylvania

PERFORATED METAL SAND AND GRAVEL SCREENS
Manufactured exactly to your specifications
Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices
CHICAGO PERFORATING CO.
2437 West 24th Place
CHICAGO, ILLINOIS
Canal 1459

Men Who Are Getting Ahead in the Rock Products Industry Are Reading **ROCK PRODUCTS**, the magazine that is written for you. Keeps you posted on news of the industry, new developments, new opportunities, methods used by others, adaptable ideas. A valuable asset to you.
Subscribe now. ONE YEAR only $2.
TWO YEARS only $3.
ROCK PRODUCTS TRADEPRESS PUBLISHING CORP. 309 W. JACKSON BLVD., CHICAGO

Boston Woven Hose and Rubber Co., Boston, Mass., has appointed W. F. Dashiell southern district sales manager. Mr. Dashiell has been a member of the company's sales organization for many years, and for more than 15 years has represented them with headquarters at Richmond, Va. Mr. Dashiell will now be in direct charge of all salesmen covering the southern territory and will continue to be located for the present at Richmond, Va.

American Manganese Steel Division of the American Brake Shoe Co., has announced the appointment of Joseph L. Mullin, formerly works manager at the New Castle, Del., plant, to general superintendent of foundries, with offices at Chicago Heights, Ill. Mr. Mullin was employed in 1914 by the then Edgar Allen Manganese Steel Co. as clerk in the annealing department. He rose through successive stages to the positions of local purchasing agent and foundry superintendent, becoming works manager in 1928. W. F. Kelly, formerly plant superintendent at New Castle, has been named works manager at that place to succeed Mr. Mullin

W. F. Kelly

The Cooper-Bessemer Corp., Mt. Vernon, Ohio, has appointed Dave M. Whyte, foundry expert, as supervisor in charge of casting sales of the company's two foundries, one at their Mt. Vernon, Ohio, headquarters and the other at Grove City, Penn.

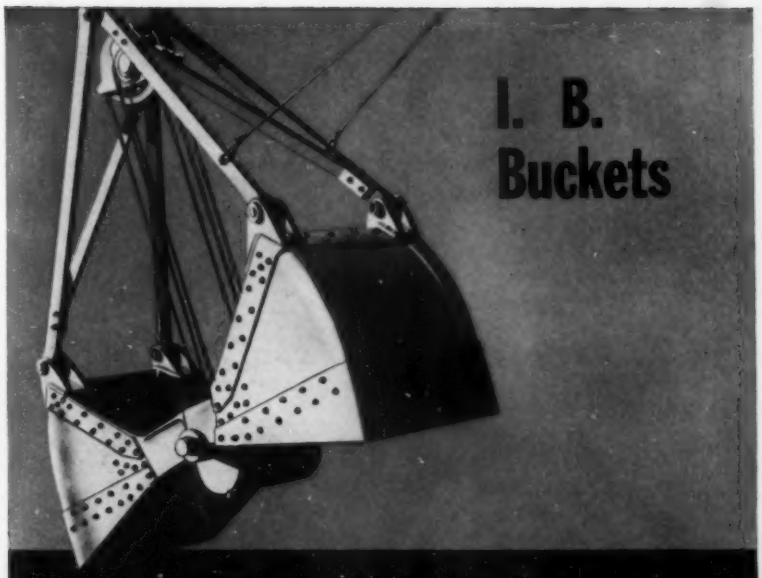
The B. F. Goodrich Co., Akron, Ohio, announces that Burton F. Stauffer, assistant general manager of the industrial products sales division, celebrated his 50th anniversary with the company.

New Incorporations

United Concrete Products, Inc., 156 Woodland St., Hartford, Conn., has been incorporated with a capital stock of $50,000, divided into 5000 shares of $10 each. Commence business with $2000. Incorporators are Lyndolph T. Bowen, Eliza A. Bowen, Kenneth C. Jansen and Theo. P. Jansen, all of Hartford.

Lind Gravel Co., Bellingham, Wash., has been incorporated. Sather, Livesey & Kingsbury, Bellingham National Bank Bldg., Bellingham, are the agents.

Howard Concrete Products Co., Seattle, Wash., has filed incorporation papers. Robert F. Sandall, Alaska Bldg., Seattle, .s the agent.



Designed and built to handle the tough jobs with ease, I. B. buckets are unusually sturdy. Extra large sheaves reduce rope wear and maintenance. They take big, deep, clean bites. Now available in rope-reeve, power-wheel and link type. For prices and further facts write to INDUSTRIAL BROWNHOIST CORPORATION, Bay City, Michigan. Offices in New York, Philadelphia, Pittsburgh, Cleveland and Chicago.

Alpha products have been used since 1878

Welded Elevator Buckets all sizes. Screw and Belt Conveyors, Storage Bins any size or type. Bin Gates Special Designs—Tanks, Pressure and Storage, all sizes. Plate and Sheet Metal Specialties.

AN AA PRODUCT
ALPHA

Alpha Tank & Sheet Metal Mfg. Co.
5007 South 38th Street, St. Louis, Missouri

Classified Advertisements

POSITIONS WANTED — POSITIONS VACANT Set in six-point type. Minimum $1.00 each insertion, payable in advance.

INFORMATION—Box numbers in care of our office. An advertising inch is measured vertically in one column. Three columns, 30 inches to the page.

CLASSIFIED—Displayed or undisplayed. Rate per column inch, $5.00. Unless on contract basis, advertisements must be paid for in advance of insertion.

FOR SALE

We offer for sale at a low price for quick disposal, a Besser standard Plain Pallet Stripper equipped to make four, six, eight and twelve inch blocks, also wood and steel jamb blocks. About $400 in extra replacement parts, with 2000 plain steel pallets.

V. PATURZO, BRO. & SON
800 Block N. Haven St., Baltimore, Maryland

4¼ FT. SYMONS CONE CRUSHER
New 1940, Standard Machine with medium bowl, 8" feed, V belt drive and AC motor.

Tidewater Equipt. & Machinery Corp.
305 Madison Ave. New York, N. Y.

Approx. 6,000 12x16 steel cored pallets.
Approx. 2,000 NEW 18½"x26" plain steel pallets for Besser machine.

•

Concrete & Cinder Blocks Products Co.
10 Buell Road Rochester, New York

NOW IS THE TIME FOR GREATEST EFFORT!

DIRECT HEAT ROTARY DRYERS
2—4'x30' Ruggles-Coles, now at Rochester, N. Y.
1—5'6"x24' Iroquois, made by Lancaster Iron Works. At Newark, N. J.
1—5'x30' Cummer. Now at Newark, N. J.
2—6'x50' Traylor Eng. & Mfg. Co.
2—5'x40' Ruggles-Coles, single shell. Now at Boston.

ROTARY KILNS
1—7'x120' Vulcan, excellent condition, complete. Out of service two weeks.
2—8'x125' Vulcan Iron Works.
1—7' and 8'x80' Traylor.
4—5'6"x7'x80' Vulcan and Reeves.
1—5'x50' Vulcan.

CRUSHING ROLLS
1—20"x14" Sturtevant, full balanced type.
1—Set 36"x16" Sturtevant.
2—40"x16" Colorado Iron Works.
1—42"x16" Allis-Chalmers.

SHOVELS, CRANES and DRAGLINES
4—50-B Bucyrus comb.
1—225-B Bucyrus.
1—200-B Bucyrus.

VIBRATING SCREENS
9—Tyler Hummers; 3x5' and 4x5', 1 and 2 deck.
1—23"x59" Link-Belt type NP-125 with motor.

HARDINGE CONICAL BALL MILLS
2—UNUSED, 10' dia. x 48", iron lined, 24" watercooled bearings, 25 tons steel balls for each mill, Lenix idler for flat belt drive.
1—4'6"x16", iron lined, with A.C. motor and silent chain drive.
1—5'x22" iron lined, with silent chain drive, with or without motor.

BALL and TUBE MILLS
1—UNUSED 7'x23'9" Tube Mill, iron lined, including 400 H.P., 3/60/2200 volt slip ring motor and starting equipment.
1—5'x20' Bonnot Tube Mill, silex lined, cast steel heads, for direct gear drive.

AIR COMPRESSORS
1—12"x10" Ingersoll-Rand ER-1, with 50 H.P. 3/60/220 V. motor, receiver, etc.
2—12"x10" Penna. 3-A with 3/60/440 V. motors.
1—4000 CFM Nordberg, driven by 750 H.P. Diesel Engine, 100 lbs. pressure.

RAYMOND PULVERIZERS
3—4 roll low side Mills, each with fan cyclone, interconnecting piping.

HAMMER MILLS
3—36"x24" Jeffrey Type B, ball bearing, one with heavy sledge hammers, other two with U-type heavy bar hammers.
1—36"x24" No. 4XA Gruendler.
1—No. 1 Williams Regular Mill, 25 H.P. required.

DRACCO DUST COLLECTOR
For handling 30 tons per hour of 20 mesh and finer materials, with three Type A compartments. No. 8 Nash vacuum pump, etc. Motors included.

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WASHING PLANT, semi-portable, 48x18 screen, scrubber, 5 conveyors, twin screw washer, sand tank, pump with 1200' 6" pipe, gasoline motors, dragscraper outfit optional.
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10-LIPPMAN, 24x18, on steel wheels, with elevators.

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CLIMAX 60 h.p. 5½x7.
WAUKESHA 50 h.p. 5x7.
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1—40-ft. steel underframe flat car, 50 ton.

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8—70-ft. steel underframe flat cars, 50 ton.

1—2-yard Hayward rehandling 2-line clamshell bucket, completely overhauled.

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Single Roll Crushers: McL. 18x24, 21x24, Fairmont 36x60", corrugated shell.
Gruendler 42x16" Double Roll Crusher.
2, 3 and 4-yard Koppel & Atlas 36" ga. Dump Cars.
4 and 8-ton 24" gauge Gasoline Locomotives.
5 Miles 24" gauge Portable Track.
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Compressors, Elevators, Screens, Conveyors.
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8x12 UNIVERSAL Crusher	$ 350.00
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10-S Cement Mixer	225.00
1 yd. Slackline Cableway	2250.00
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⅜ yd. Dragscraper Hoist	350.00
Double Drum MUNDY Hoist	250.00
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One and one-half yard, practically new, Manganese Shovel Dipper. Immediate shipment, no priority.

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Telsmith Gyratory Crusher 13-B, Shop No. 1467. In excellent condition.

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2—Baldwin Locomotives, 33 tons, 4'8½" gauge, saddle tank, coal fuel, 14" cylinders, 160 lbs. boiler pressure, and 44" wheel diameter.

100 tons of ⅝" and ½" plate.

11 Kilns.

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One Good Roads Roller Bearing Reduction Crusher 10 x 30.

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1—Austin Machinery Corporation gasoline powered crawler crane, No. T 10054, complete with shovel front and 31' crane boom. Powered by 4 cylinder Climax gasoline engine. Crane ¾-yd. capacity, fully revolving, mounted on caterpillars.

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1—310 cu. ft. portable air compressors, Ingersoll-Rand and Gardner Denver, all gasoline powered on four steel wheels.
1—210 cu. ft. Worthington two-stage portable compressor No. 5513, power 75 horsepower, Hercules gasoline engine, mounted on four steel wheels.
3—220 cu. ft. Chicago Pneumatic single stage portable air compressors, gasoline powered on four steel wheels.
1—180 cu. ft. Barnes single stage portable air compressor, gasoline powered on four steel wheels.
2—160 cu. ft. two stage portable compressors, Schramm & Worthington gasoline powered, mounted on four steel wheels.
1—160 cu. ft. Ingersoll-Rand single stage, portable gasoline powered, mounted on four hard rubber tired wheels.
1—110 cu. ft. Ingersoll-Rand single stage, gasoline powered, mounted on four steel wheels.
1—105 cu. ft. Chicago Pneumatic two-stage, gasoline powered, mounted on four steel wheels.
Also a large number of electric, stationary compressors from 25 to 1190 cu. ft., displacement.

CRUSHERS

1—No. 4 Champion jaw crusher, size 9x15", Ser. No. 2606.
1—No. 2 Climax jaw crusher, size 9x16".
1—Buchanan jaw crusher, size 10x16".
1—Acme jaw crusher, Ser. No. 1873, size 12x20".
1—Acme jaw crusher, Ser. No. 1686, size 9x16".
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24".
1—Allis Chalmers, No. 5 gyratory crusher, Ser. No. 5331, opening 10x38".
1—Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35½".

DERRICKS

3—Steel Gin Derricks: 1—20 ton American-Terry, 90' mast, 110' boom; 1—5-ton Terry Guy Derrick, 70' mast, 60' boom; 1—5-ton Insley, 75' mast, 80' boom; Stiff leg derricks: 1—12-ton derrick, 75' boom for hook work; 1—2-ton Pittsburgh, 26' boom, 15' mast. Also a number of wood stiff leg derricks, 1 to 5-ton cap.

HOISTS (Elec., Gas, Steam)

55—Electric, ranging from 20 HP. up to 125 HP., consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.
Gas hoists ranging from 8 to 120 HP., single, double and triple-drums; all standard makes (38 in stock).
Steam, ranging from 8 HP. to 60 HP., single, double and triple-drums; all standard makes.

DRILL STEEL

200 pcs. 1¼" round, from 2' to 24'; with threaded ends for bits.
200 pcs. 1¼" round, with formed 2" bit, winch can be threaded.
50 pcs. 1⅝" hexagon from 2' to 12', threaded for bits.
40 pcs. 1" hexagon from 2' to 8', threaded for bits.
2000 new 4-point Timken bits, for 1" rod.

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1—10" Morris sand pump, Ser. No. 86864, cap. 87 cu. yds. per hr.
1—8" Cataract dredging pump, Ser. No. 175895, cap. 2000 GPM @ 53' head.
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1—Vulcan 6'x42' Rotary Dryer, ½" shell.
1—Ruggles Cole Class A-4, 4½'x26' Rotary Dryer, with furnace, piping and fan.
2—Raymond High Side Roller Mills, 3 and 5 roll.
1—Hardinge Mill, 7'x36", with titanite liners and air classifier.
1—Patterson 2'6"x3'6" Continuous Tube Mill, motor driven.
4—Chain Bucket Elevators, with steel housing 40' to 50' centers, buckets 10"x6" to 13"x8".
5—Tyler Hummer Screens, 3'x5', 4'x4'.
1—Jeffrey 24"x12" Hammer Mill, Type "A," with 25 HP. motor.
1—Jeffrey 24"x18" Hammer Mill, Type "A," with 15 HP. motor.
10—Jaw Crushers, 7"x10" to 24"x36".
1—Jeffrey Hammer Mill, 24"x36".
13—Hammer Mills, Williams, Jeffrey, Gruendler, American, etc.
1—No. 5 McCully Crusher.
7—Rotary Dryers 4'x20' to 6'x60'.
1—Rotary Kiln 8'x9'x200'.
3—Smidth 6'6"x21'6" Tube Mills.
2—Williams Universal Pulverizers, No. 3.
3—Ruggles Cole 70"x30' Rotary Dryers.
500' Screw Conveyor, up to 12".
2000' Belt Conveyor, 12" to 24".

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420 HP Busch Sulzer, 270 and 180 HP Worthington. All complete and fine shape. 3/60/2300 Volt.
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1574' Synchronous Motor Driven Air Compressor.
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COMPLETE STONE CRUSHING PLANT
Capacity 850 tons per day. Principal items are: 1—Farrel 24x36 Jaw Crusher, 1—Traylor 3' type TY Reduction Crusher, 1—4x12 triple deck Screen, 1—long 24" Belt Conveyor and 1—short 24" Belt Conveyor, complete with steel bins. Plant can be operated with electric motors, all of which electrical equipment is available, or can be operated with two 100 H.P. Diesel Motors and one 50 KW Diesel motor generator set. Plant all set up in working position, perfect condition throughout, immediate delivery.

LOCOMOTIVES

1—American 41-ton, 4-wheel, saddle tank, Locomotive, electric lights, steam brakes, ASME Boiler, 190 lbs. Sale or rent.
1—American 68-ton, 6-wheel, Switcher with tender, electric lights, air brakes, power reverse, overhauled.
2—Vulcan 20-ton, 4-wheel, saddle tank, standard gauge, air brakes, ASME code boiler.
1—Vulcan 14-ton, 4-wheel, saddle tank, 36" gauge, cylinders 9x14, ASME boiler.

COAL CRUSHER

1—Jeffrey 24x24 single roll coal Crusher. New condition.

CONE CRUSHER

1—Nordberg (Symons) 2 ft. with fine bowl.

BELT CONVEYORS

1—42"x260 ft. and 1—36"x740 ft., complete with all mechanical parts; belt in new condition, motor, controls, etc., roller bearing equipped.

LOG WASHER

1—Allis-Chalmers 25 ft., heavy duty, Hutch type, Log Washer, with steel tank, ⅜" plate, with 2 logs with paddles 35" dia.

JAW CRUSHERS, GYRATORY CRUSHERS, ROLL CRUSHERS, DRYERS AND KILNS, HOISTS, CARS, CRANES, SHOVELS, ETC.

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Motors and Generators, A.C. and D.C., for sale at Attractive Prices. Large Stock. New and Rebuilt. All fully guaranteed. Send us your Inquiries.
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Tanks of all kinds and sizes
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1—¾-yd. Osgood Commander Gas Shovel (Heavy Duty).
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Otisville Sand & Gravel Co., Inc.
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Allis Chalmers 7 x 30 Tube Mill

1—Allis-Chalmers Dry Grinding Compeb Mill, No. 8745. This is a four compartment mill with the first compartment 10' long and 8' in diameter with taper the rest of the 45' length of the mill 7' in diameter. The mill has chilled iron liners, and 36" table feeder, 72" Cutler Hammer Magnetic Clutch, and 3 compartment Dust Collector.
1—Williams mill, size 3.
5—No. 8 Krupp steel ball mills, spur geared, with counter shaft.
14—30" Griffen Mills.
26—42" Fuller Lehigh pulverizers, each with belt idler.
3—33" Fuller Lehigh pulverizers, each with belt idler.
1—5'6" diameter x 22' long F. L. Smidth & Co. Tube Mill with chilled iron lining and steel heads and trunnions. Trunnion discharge.

NEW SPARE PARTS FOR ALL ITEMS

Steel Balls

120 Ton Steel Balls, ¾" to 5".

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1—Double drum steam hoist S. Flory Mfg. Co., 11" x 14" duplex.
1—Westinghouse 60" Single drum hoist.

Steel Buildings

24—Steel buildings suitable for re-erection.

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3—800 H.P. Babcock & Wilcox waste heat boilers, 200 lb. pres.
2—684 H.P. Edgemoor Boilers, 200 lb. pres.
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All complete with blowers, feed pumps, feed water heaters, etc.

• CRUSHERS

1—Allis-Chalmers Fairmont Roll Crusher, 36" x 60".
2—No. 6 Gates gyratory rock crushers.
1—No. 6 McCully gyratory rock crusher, style K.
5—No. 5 Gates gyratory crushers.
1—Mosser rotary clinker crusher.
1—No. 10 McCully gyratory rock crusher with extra gear, eccentric and bell.

NEW SPARE PARTS FOR ALL ITEMS

STEEL BINS

Steel Plate Storage Bins that can be re-assembled—Order at once. 58 Bins in Various Capacities & Sizes.

Cu. ft.	Dimensions
35,184	18'4" x 70' x 27'5" high
19,592	11'3" x 40'6" x 43' high
10,440	12' x 58' x 15' high
9,270	12' x 51'6" x 15' high
7,460	10' x 55'3" x 13'6" high
6,827	12'8" x 44' x 12'3" high

Also various BINS as follows

4—	1,650	cu. ft. and under
1—	1,116	cu. ft. and under
5—	896	cu. ft. and under
6—	640	cu. ft. and under
7—	532	cu. ft. and under
12—	370	cu. ft. and under
11—	288	cu. ft. and under
2—	95	cu. ft. and under
1—	37	cu. ft.

CONVEYORS

STEEL SCREW

6"—7½"—8"—10"—12"—14"—16"—18" and 20". In Steel Box. Over 10,000 ft., all lengths.

RUBBER BELT

14"—16"—18"—20"—24" and 28" Centers varying from 30' to 203'. Some with movable Trippers.

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Thousands of feet of bucket elevators, all sizes of buckets, mostly all steel encased.

BUCKET SIZES: 10 x 18 — 10 x 15 — 9 x 14 — 9 x 13 — 9 x 12 — 8 x 16 — 8 x 15 — 8 x 14 — 8 x 13 — 8 x 12 — 7 x 12 — 7 x 11 — 7 x 10 — 6 x 10 — 6 x 9 — 6 x 7.
With—844; 103; 132 chain from 12' to 60' heights.

NEW BUCKETS and GEARS

• KILNS

Vulcan Iron Works Steel Rotary Kilns

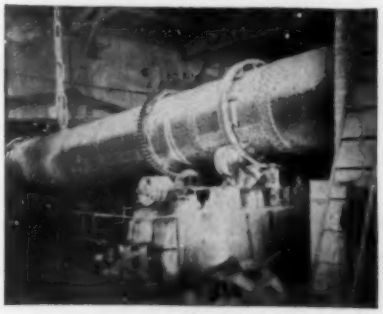
3—Vulcan Iron Works steel rotary kilns, 8'6" x 7'6" dia., 125' long, fire brick lined.
1—Vulcan Iron Works steel rotary kiln, 7'6" x 7' dia., 125' long, fire brick lined.
6—W. F. Mosser & Son steel rotary kilns, 5'6" x 5' dia., 60' long, fire brick lined.

NEW SPARE PARTS FOR ALL ITEMS

Air Compressors

1—Ingersoll-Rand 18¼" x 14" x 18" horizontal duplex air compressor, belted motor drive, with 3'6" x 20' riveted steel air receiver.
1—Ingersoll-Rand Duplex Air Compressor, 11" x 16" x 18" belted motor drive.

• DRYERS



W. F. Mosser & Son Steel Rotary Dryers with Steel Stacks

2—W. F. Mosser & Son steel rotary dryers with 65" steel stacks.
2—W. F. Mosser & Son steel rotary dryers, 72" x 60" dia., 60' long, bevel gear drive, each with counter shaft and 40' steel stack.
1—W. F. Mosser & Son steel rotary dryer, 72" x 60" dia., 55' long, bevel gear drive with counter shaft and 35' steel stack.
1—W. F. Mosser & Son steel rotary dryer, 72" x 60" dia., 55' long, bevel gear drive, with counter shaft and 50' steel stack.
1—Ruggles 5' x 30' Rotary Dryer.

NEW SPARE PARTS FOR ALL ITEMS

Engine Sets

6—Engine Generator Sets, 800 KW, 750 KW, 575 KW, 475 KW and two 400 KW D.C. sets.

Miscellaneous

4—Buffalo forge blowers and exhausters.
Complete Stock Room Supplies, New Gears, Bearings, Belting, Safety Switches, Pumps, Shafting, and Pulleys, etc. Thousands feet of conduit.

Write direct to Plant office, P. O. Box 188, Easton, Pa.

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HEAT and POWER Company, Inc.

45 BOND STREET *Phone:* ALgonquin 4-3874 (12) **NEW YORK, N. Y.**

AT ABSOLUTE PUBLIC

AUCTION

WED., AUGUST 25, 1 P.M. E. W. T.

THE MACHINERY AND EQUIPMENT, LAND AND BUILDINGS
FORMERLY THE MINING PROPERTY OF THE

AMERICAN ALLOY CORP.

ON THE PREMISES

STRASBURG, VIRGINIA

(STRASBURG IS LOCATED 75 MILES FROM WASHINGTON, D. C.)

CONSISTING OF

MACHINERY

Reliance Screens, Rotating Screens, Jaw Crushers, Settling Tanks, Deister Concentration Tables, Deister Slimers, Gyratory Crushers, Wilfley Sand Pumps, Telsmith Intercone Reduction Crusher, Dorr Duplex Rake Classifier, 8 Spigot Tahrenwald Sizer, Denver Hydro Classifier, Hummer Vibrators, Bucket Elevators, Modified Harz Type Jigs, Deister Overstrom Sand Tables, Adjustable Stroke Eccentrics, 2½ Ft. x 4 Ft. Rod Mill, Duplex Drag Dewarter, Ro-Tap Testing Shiev Shaker and many other major items too numerous to mention.

EQUIPMENT

Motor Pumps, Motors, Switches, Transformers, Power Panels, Cutler Hammers, Countershafting, Belting, Pulleys, Line-shafting, Mine Cars, Voltage Control Panels, Schramm Compressor, etc.

MISCELLANEOUS

COMPLETE CARPENTER SHOP AND EQUIPMENT, COMPLETE BLACKSMITH AND MACHINE SHOP EQUIPMENT, OVER 250,000 FEET 1 INCH and 2 INCH LUMBER. OVER 500 SQUARES HEAVY CORRUGATED ROOFING AND SIDING. OVER 5,000 FEET 4, 7 and 8 INCH STEEL PIPE. 90,000 GALLON REBUILT WOOD STORAGE TANK, ETC.

ELECTRICAL EQUIPMENT

Over $10,000 nearly new switchboard, 500 Volt, 363 Amps., including automatic resistance starter, 40 H.P. and one Square D convertible power panel, 600 Volt, 800 Amps.

LAND AND BUILDINGS

Approximately 260 Acres of Land, original site of mine including one frame 6 room dwelling ready for occupancy.

ALL EQUIPMENT, MACHINERY, PIPE, POWER EQUIPMENT HAS BEEN REMOVED FROM THE MINE AND IS NOW STORED ON THE SITE READY FOR IMMEDIATE LOADING.

BUS TRANSPORTATION ARRANGED FROM STRASBURG OR WINCHESTER, VIRGINIA, TO THE MINE SITE.

ALL TO BE SOLD IN SINGLE LOTS WITHOUT LIMIT OR RESERVE

INSPECTION COMMENCING AUGUST 16TH

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HARRIS AUCTION & SALES CO.

813 MAIN ST. CINCINNATI, OHIO

COLEMAN HARRIS, *AUCTIONEER*

3—Whitcomb Locomotives, Gas, 12 ton, 36" Gauge—Rebuilt.
20 ton Ohio Loco-Crane, 50 ft. boom.
Hayward 2 Yd. Orange-Peel Bucket.
¾ Yd. Model 400 P & H Shovel.
1 Yd. Link Belt K-30 Shovel.
1 Yd. Northwest 105 Shovel-Crane.
10 ton Buf-Spr. Roller, Gas, 3 Wh.
8 ton Buf-Spr. Roller, Gas, 3 Wh.
3 to 4 ton Buf-Spr. Roller, Gas, T.
1½ to 2 ton Pierce Roller, Tandem.
24x13 Farrel-Bacon Crusher.
Eimco Tunnel Shovels, 12-B and 20.
5—Electric Hoists, 40, 50 and 60 HP.
McK-T. Pile Hammers, 3, 5, 6, 7.
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50 HP. Locomotive Boiler, Nat. Bd.
Barnes and LaBour self-pr. Pumps, 4".
Thor and Ing-Rand Air Pumps.
Gard-D. Compressor, 630' A. A. E. Dr.
2—Ing-Rand 110' Compressors.
22—Busters, Spades, Jackhammers, Sheeting Hammers.
1 Yd. Round Shaft Buckets.
1 Yd. and ½ Yd. Dump Buckets.
Pullshovel and Skimmer Attach. for ½ Yd. P & H.
2—Shovel Attach. for Byers Bearcat Jr.
Shovel Attachment for 41-B Bucy-Erie.

J. T. WALSH
Brisbane Building Buffalo 3, N. Y.

USED—WORTHWHILE EQUIPMENT FOR SALE

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26" Traylor Bulldog, with Grizzly and 250 HP. motor.
4—Compeb Mills with 400 HP. motors.
1—No. 10 Austin gyratory crusher. Bargain.
No. 6 (12") Traylor Bulldog. Must move for $1350.

LIQUIDATING

1—200 and 1—400 HP. Electric Hoists. Also 220 HP. Marine. NEW.

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ENGINES

Write or wire me for ANY machinery wanted.

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ONE 5' X 14' DOUBLE DECK SYMONS VIBRATING SCREEN, COMPLETE WITH DRIVE BUT WITHOUT MOTOR. WEIGHT—APPROX. 6 TONS. AGE—5 YEARS. NO PRIORITY NEEDED.

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1—Stack Type Belt Conveyor complete — 112 feet long, 20" Belt, Gas Engine Driven.
1—Stack Type Belt Conveyor—105 feet long, 24" Belt, Gas Engine Driven. All this material new, never been used.
2—9 feet by 18 inches Jeffrey Type Plate Feeders.

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1-yd. Hayward Orange Peel type bucket. Good condition. Heavy duty type.

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Besser Super D-8 Stripper. Completely overhauled New Pins, Rollers, Bushings and other wearing parts. Attachments for 2, 3, 4, 6, 8 and 12 inch blocks, both 16 and 18 in. lengths. Lack of business compels sale. Rock Products, Box B-18, care Rock Products, 309 W. Jackson Blvd., Chicago, Ill.

Classified Ads Produce Quick Results

142 HP. 6-cyl. Superior Diesel, dir. con. to 100 KW., 3-ph., 60-cyc. gen. Complete unit.
187 HP. 4-cyl. Buckeye Diesel, V-belt drive to 125 KW., 3-ph., 60-cyc., 440-v. generator. Both above units may be seen in operation.
¾-yd. Byers Gas Crawler Crane.
¾-yd. Baycity Type R Comb. Dragline and Shovel.
¼-yd., ¾ Swing Fundem Cr. Gas Shovel.
10x10 Ing.-Rand Compressor.
10-ton, 3-wheel, gas, Galion Roller with Scar.
12′ Blade Caterpillar Pull Grader.
Caterpillar and Austin Elevating Graders.
100′ Boom, 10-ton Steel Stiffleg Derrick with 75 HP. Elec. Motor, 2 Dr. Hoist and Swinger.
4′x12′ Nordberg 3-Deck Vib. Screen.
55 and 60 HP. Portable High Press. Boilers.
Two and Three Drum Hoists, Steam.
Two and Three Drum Gas Hoists.
9x16 Roller Bearing Jaw Crusher.
3—Koehring Gas Rubber Tired 10-yd. Scrapers.
7—Euclids, Gas, Bottom Dump, Rubber Tired.
8 and 10-ton Tandem Steam Rollers.
⅝ and 1-yd., 1 ½-yd. Slackline Cableways.
⅝-yd. Hansen Gas Cr. Shovel.
¾-yd. Byers Gas Shovel, New 1939.
5-yd. Sauerman Crescent Power Scraper.
30″ Stedman Impact Crusher.
24″x20″ Jeffrey Hammermill Crusher.
20′ Ord, 2 Screed Finisher with 18′ and 25′ Ext.
10,000′ 2″ Pipe, Pumps, Trench Rollers, Etc.

We have all kinds of equipment. Tell US what you want to BUY OR SELL.

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New • Rebuilt • Used

Derricks — Hoists: Gas, Steam, Electric, Air—Compressors — Wagon Drills — Pneu. Tools. Conveyors: Belt or Bucket Type. Aggregate and Cement Bins and Weighers. Road Forms —Road Machines.

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FOR SALE

1 Ingersoll-Rand 9x8 Air Compressor.
1 7½D Gates Gyratory Crusher 42″x20″.
1 Colorado Iron Works 36″x10″ Improved Standard Crushing Roll, spring tension, cast steel rolls, steel enclosed.
1 Traylor Engr. Co. 5′0″ dia. x 25′ long Revolving Stone Screen, open end type, level gear drive.
1 Chalmers & Williams 36″ Symons patent horizontal disc stone crusher.
1 National Hoisting Engine Co. 200 H.P. single geared, single drum, electric hoist, 48″x64″ drum; spur gear connected to—
1 Westinghouse 200 H.P. slip ring induction motor.
1 Pneumatic toggle joint car dump, 13′x7′.
2 Koppel Kiln Stone Cars 66″x72″ side dump.
1 Broughton Mixer.
1 Hair Picker.
1 A. D. Cook, size 11 vertical geared deep-well pump.
1 3½ ton Clyde Hydrator.
1 Jeffrey Mfg. Co. 42″x24″ type A Swing Hammer Mill, direct connected to—
General Electric 50 H.P. Induction Motor.
1 Bucyrus 110-C Steam Shovel; caterpillar traction.
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1 Iron Clad Structural Steel Building, 41′x100′.
1 General Electric Co. 50 k.w. D/C Generator—type CL-90—form B—200 amps. 250 volts—1080 R/P/M—complete with rheostat—sliding base—paper pulley.

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Conveyor Belting...Transmission Belting...Elevator Belting...Fire, Water, Air, Steam, Suction or Welding Hose, etc.

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CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING
ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48″	8	1/8″	1/16″	20″	5	1/8″	1/32″
42″	5	1/8″	1/16″	20″	4	1/8″	1/32″
36″	6	1/8″	1/16″	18″	4	1/8″	1/32″
30″	6	1/8″	1/16″	16″	4	1/8″	1/32″
30″	5	1/8″	1/16″	14″	4	1/16″	1/32″
24″	5	1/8″	1/32″	12″	4	1/16″	1/32″
24″	4	1/8″	1/32″				

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING
HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18″	6	10″	6	6″	5
16″	6	10″	5	5″	5
14″	6	8″	6	4″	5
12″	6	8″	5	4″	4
12″	5	6″	6	3″	4

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ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
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PROTECT THAT PLANT
FIRE HOSE
APPROVED SPECIFICATION HOSE EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½″	50 feet	$28.00
	25 "	16.00
2″	50 "	23.00
	25 "	13.00
1½″	50 "	20.00
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Specify Thread On Couplings

SPECIAL OFFER . . . HEAVY DUTY
RUBBER HOSE
WATER HOSE

I.D. Size	Each Length with Couplings Attached		Per Length
¾″	25 feet		$4.25
1″	50 "		8.00
	25 "		6.25
1¼″	50 "		12.00
	25 "		7.50
	35 "		10.50
	40 "		12.00
1½″	50 "		15.00
	25 "		10.00
	35 "		14.00
	50 "		20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½″	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾″	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1″	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

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McMYLER GASOLINE OPERATED CRAWLER CRANE. RATED ONE YARD CAPACITY. WITH 40 F'T. BOOM. POWERED BY A CLIMAX MOD. TU ENGINE.

P. A. HENAULT
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Four-way, three-deck Diamond screen, now in operation. Five hundred dollars, f.o.b. Buchanan, Virginia. This unit is in good working condition and is being replaced by a larger screen.

JAMES RIVER HYDRATE & SUPPLY CO.
Buchanan, Virginia

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AIR COMPRESSORS
BELTED: 255, 528, 676, 1000, 1200 & 1570 Ft.
ELECTRIC: 473, 676, 807, 1302, 1722 & 2200 Ft.
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PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft.
STEAM: 49, 310, 528, 1300, 2200 & 3600 Ft.
CLAMSHELL BUCKETS, SKIPS & GRAPPLES
Owen R A & H Stone Grapples.
3 Yd. OWEN Type S Material Handling.
1½ Yd., 1 Yd. & ¾ Yd. HAYWARD Class E.
18 Steel Skips 6¼ x 6 x 3¼.
5 Ton Bucyrus Rock Grabs.
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⅝ Yd. 5 Ton O & S 30 Ft. Boom.
12 Ton NORTHWEST 50 Ft. Boom Gas.
20 Ton LIMA, 750 Diesel, 65 Ft . Boom.
25 Ton BROWNING & 30 Ton AMERICAN Loco.
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2 Yd. Marion Steam Shovel.
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1 Yd. NORTHWEST Gas.
1½ Yd. LIMA Diesel
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46—KOPPEL 1½ Yd. 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 In. Ga.
28—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.
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FLAT CARS
9—50 ton std. ga. heavy duty flat cars.
HOISTING ENGINES
Gas: 15, 30, 60, 100 & 150 HP.
Electric: 30, 52, 80, 100 & 150 HP.
Steam: 6¼x8, 7x10, 8¼x10, 10x12, 12x14.
DIESEL UNITS
75, 90, 180, 200 HP. F. M. Engines.
110 HP Ingersol Rand Engine.
175 KVA Worthington 3/60/2300.
275 KVA Fairbanks 3/60/2300.
BALL, ROD AND TUBE MILLS
6x8 Pebble Mill & 5x5 Batch Mill.
5'x22" HARDINGE CON. Dry Ball Mill.
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8'x22" HARDINGE CONICAL Ball or Pebble Mill.
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4x16, 5x18 & 5x22 Tube Mills & 6'x22'.
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 6x12 & 5x12 ROD MILLS.
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RAYMOND Auto Pulverizer No. 0000, 0 & 3.
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GRUENDLER XXIR Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 ft. Chaser M.
STEEL STORAGE TANKS
10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.
MATERIAL BIN
110 Ton Blaw Knox 2 Compt.
400 BARREL CEMENT BIN
400 Barrel Butler Portable Steel Cement Bin with Fuller automatic batcher, push button control.
SEPARATORS AND COLLECTORS
8, 10 and 14 ft. Separators, Gayco & Bradley.
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36x60 Fairmount & 36x20 Diamond.
JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12, 30x15, 30x13, 36x15, 36x30, 36x18, 36x14, 36x9, 36x6, 36x10, 36x24, 42x9, 48x24, 48x36, 60x42, 84x66, 84x16, 9x36.
CONE & GYRATORY CRUSHERS
42 in. McCully Mammoth Gyratory.
6 No. 19, 25, 27 & 49 Kennedy.
18 in., 24 in., 30 in., 36 in. & 48 in. Symons Disc.
4—10 72 Traylor 4 ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory, also 16 inch 8 in. Traylor T. Gyratory.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.
16 Inch Austin Model 105.
6, 10 & 13 Inch Superior McCullys.
SYNCHRONOUS MOTOR GENERATORS
100 K.W. RIDGWAY 3/60/2200-250-275 volt.
150 K.W. GEN. ELEC. 3/60/2300-250-275 v.
200 K.W.RIDGWAY 3/60/2200-250-275v.,900 rpm.
SLIP RING MOTORS
52HP. GEN. ELEC. 3/60/440 v., 1200 rpm.
(3) 100 HP.GEN.ELEC. 3/60/440v.,900-1200 rpm.
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BELT: 1000 Ft.60 In., 700 Ft.40 In., 600 Ft.36 In., 800 Ft.30 In., 1642 Ft.24 In., 517 Ft.20 In., 207 Ft.18 In., 800 Ft.16 In., 300 Ft.14 In.
IDLERS: 54 In.,42 In., 36 In.,30 In., 24 In.,20 In.,18 In.,16 In. & 14 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft.24 In..30 In.&36 In.Sections.
ROTARY DRYERS AND KILNS
30 In.x20 Ft.,3 Ft.x30 Ft., 4 Ft.x30 Ft., 54 In. x30 Ft., 42 In.x24 Ft., 5 Ft.x30 Ft., 5 Ft.x16 Ft., 5 Ft.x60 Ft. 6 Ft.x60 Ft., 6 Ft.x20 Ft., 6 Ft.x70Ft., 10x20, 7½x100&5x110 Ft. Kilns.
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GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 30 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom,25 Ton 100 Ft.Boom.75 Ton 135 Ft.Boom.
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GASOLINE: 3 Ton,5 Ton,8 Ton,12,14,and 30 Ton.
STEAM: 9Ton,20 Ton,40 Ton,60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton.
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VIBRATING: 2x4, 3x6, 12x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72 & 4x12, 1, 2 & 3 Deck.
KUMMER ROTEX, NIAGARA & ROBINS.
REVOLVING: 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x33, 4x24, 5x30, 5x20, 6x30.

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SHOVELS—CRANES
Lima Model 101 comb. Shovel-Crane. Excellent.
Moore Speedcrane, 15 tons, gas.
Osgood heavy duty gas Shovel, 1 yard.
Universal 7½-ton Truck Crane, 3 axle, 10 wheels.
P. & H. Model 600 Shovel, 1-yard cap.
Byers ⅝-yd. Truck Crane, 3 axle, 10 whl. pneu.
Bucyrus Erie Model 1030 Electric Tunnel Shovel.
Bucyrus Erie 50B Steam Shovel, 2 yds.
Marion Model 460 Electric Shovel, 1½ yds.
Marion Model 52 Steam Shovel, 1¾ yds. cap.
General ½-yard Crane, Cummins Diesel engine.
Byers ½ revolving Crane, Shovel and Backhoe.
Ind. Brownhoist 10-ton Cat. Crane, gas.
Brownhoist, 5-7½-ton Crane, gas.
CONVEYORS, ELEVATORS, LOADERS
1000-ft. 36" Belt Conveyor, with Rollers and Idlers. Complete except no frames. Like new.
60' Belt Elevator 14" x 11" x 7⅝".
50' Belt Elevator 12" x 6" x 4".
Barber Greene Model 44A Loader, rebuilt.
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Allis-Chal. Model LO Tractor with bulldozer.
TD40 Diesel Tractor with bulldozer.
RD6 Tractor with bulldozer.
Allis-Chal. L Tractor with Baker bulldozer.
Cletrac Model FG Tractor with Garwood bulldozer.
6—I.R. Wagon Drills.
4—Gardner-Denver Wagon Drills.
6—Spencer Dust Collectors, equal to new.
2—Mack Trucks 6BX, Boulder type, 12 yds.
2—Sterling Trucks 170-C, Boulder type, 12 yds.
1—International Truck, 12 yds., Boulder type.
Butler 16-cu. ft. Asphalt Pug Mill.
2—Steel Stiff-leg Derricks, 10 tons, 100' bin.
Hardinge Conical Ball Mill, 4½' x 16".
Allis-Chalmers Cent. Pump, electric, 3500 GPM.
Worthington 8" cent. Bronze impeller, elec. port.
Dredge Pump 10" F.H. cent., nearly new.
CONCRETE EQUIPMENT
Complete Road Building Plant.
B.K. 56-ton, 2 compt. Bin with weigh batcher.
Fuller Kinyon Bulk Cement Unloader, portable.
Fuller C40 Rotary Air Compressor, electric.
Rex Pumperete Model 200 with 750' pipe.
Rex Pumperete Model 100 with pipe.
Rex Pumperete Model 180 with 500' pipe.
Ransome 37E Dual Paver with boom and bucket.
COMPRESSORS
I.R. belted 900-cu. ft. 600-cu. ft., 528-cu. ft., Portable 310-cu. ft.; Sullivan 1214-cu. ft., 1050-cu. ft. Diesel, 455-cu. ft.; Worthington.
I.R. Portable, 2 stage, 315-cu. ft.
CRUSHERS—CRUSHER PLANTS
Gyratory Crusher: K.V.S. 30, 37-S, 49; 32, 8A, 8B; Traylor 8"; McCully 13", 8", 6".
Allis-Chalmers Anaconda Type, 54"x24".
Jaw: 6x12, 9x16, 10x20, 14x24, 12x26, 13x30, 15x30, 16x32, 56x84.
Complete Rock Crushing Sand & Gravel Plants.
BUCKETS—STONE SKIPS
1½-yd. Williams Clamshell, rehandling.
2-yd. Hayward Clamshell, rehandling.
¾-yd. Williams Clamshell, digging.
2—½-yd. Hatsa rehandling, Clamshell.
¾-yd. Hatsa Clamshell, rehandling.
Erie ¾-yd. Clamshell, rehandling.
Owen Stone Grapple.
Hayward ¾-yd. Standard Orange Peel.
LOCOMOTIVES—CARS
American 60-ton, steam, std. ga.
American 50-ton, steam. Saddle Tank.
Vulcan 16-ton, 36" gauge, gas.
Vulcan 8-ton, std. gauge, gas.
Milwaukee, 9 ton, std. gauge, gas.
Vulcan 6-ton, gas, 36" gauge.
20—Phoenix, 5 yd. heavy duty, 36" ga. Quarry Dump Cars.
21—Koppel, 4 yd., 36" gauge Dump Cars.
3—30-ton Standard Gauge Flat Cars, rebuilt.

RICHARD P. WALSH CO.
30 CHURCH STREET NEW YORK

1¼-yd. Osgood Shovel.
½-yd. Byers Shovel and Crane, ¾ swing.
⅝-yd. Austin Shovel, ¾ swing, tractor type.
2—24x36 Farrel Jaw Crushers, type 14-B.
2—15x30 Farrel Jaw Crushers.
1—18x36 Acme Jaw Crusher.
13-A Telsmith Gyratory.
37 Kennedy Reduction, type 8.
5x10 double, 5x10 single Niagara vibrator screens.
4x8 double, 3x8 double Telsmith vibrator screens.
5'x30' — 5'x24' — 5'x20' — 4'x18' — 42"x16' — 3'x18' revolving screens.
1 single and 1 double Lewis Foundry Machine Co., screw washers.
Allis-Chalmers 6" centrifugal pump type 8-15,000 G.P.M.
80'x18" Belt Conveyor complete with frame and belt.
1—18" Bucket belt Elevator 70' center.
17—30" Bucket belt Elevator 66' center.
1—24" Bucket chain Elevator 80' center.
1—16" Bucket chain Elevator 40' center.
1—12" Bucket chain Elevator 36' center.
75 hp., 850 R.P.M.; 40 hp. 1200 R.P.M., slipring.
40 hp., 690 R.P.M. slipring; 25 hp., 850 R.P.M. slipring.
25 hp., 870 R.P.M. Electric motors.
2—G.M.C. Dump trucks model A.C. 402, 3-yd. steel bodies, rebuilt 1939.

Frank A. Kremser & Sons, Inc.
R. D. No. 2, Reading, Pa.
Ph. Leesport 100 Night Ph. Reading 42521

CRUSHERS, ROLLS, MILLS
Robins 24"x30" double roll coal crusher.
Stevenson 24"x39" single roll crusher.
Simplex Unit Coal Pulverizer, type 33A.
Single roll crusher with knobs, 24"x24".
American Standard double roll crusher 36"x30".
Corrugated double crushing rolls, 16"x16".
Sturtevant No. 0 Rotary Fine Crusher.
Williams No. 2 "Semi Vulcanite" hammer mill.
Williams No. 2 "Regular" hammer mill.
New England Jaw Crusher, 11"x20".
Climax jaw crusher, 8"x14".
Acme jaw crusher, 24"x36".
Traylor 11" gyratory "Bulldog" crusher.

SCREENS, SAND TANKS
Revolving screens, 3'x8', 4'x16', 5'x20'.
Hummer vibrating screens and generators.
Two "Jigger" three-deck 2'x5' vibrating screens.
Plat-O two-deck 4'x6' vibrating screen.
Two Telsmith No. 7 complete sand tanks, Tilding type.

BUCKET ELEVATORS
46' continuous elevator, 18" buckets.
50' centrifugal chain elevator, 16" buckets.
50' centrifugal chain elevator, 20" buckets.
40' centrifugal chain elevator, 12" buckets.
Two 35' centrifugal chain elevators, 10" buckets.
35' continuous belt elevator, 30" buckets.
1500' 6-ply 20" punched elevator belt.
Gears, sprockets, elevator and driving chain.
New K2 and couplings for C102½ and C188 chain.

BELT CONVEYORS
370' of 30" trough belt conveyors.
Two 100' 36" trough belt conveyors.
100' of 16" trough belt conveyors.
370' of 14" trough belt conveyors.
65 Robins No. 105 42" trough idlers.
100 roller bearing 38" return idlers.
Trough idlers and pulleys for 14" to 36" conveyors.
86' new 54" conveyor belt, 5-7 ply, ⅜" top.
1000' of 30" 6-ply used conveyor belt, ⅜" top.
360' used 42" 7-ply conveyor belt.
Cast and steel driving pulleys.
4 Robins 14" automatic belt trippers.

MISCELLANEOUS
30" 1½-ton Mercury battery mine locomotive.
Two electric car pullers.
One electric cargo winch.
Flat cars for 20" and 24" gauge.
Centrifugal pumps, motors and generators.
Revolving dryer, 4'x21', 18" flue.
Dings Magnetic Pully, 12" dia., 14" face.
Worm drive speed reducer, 75-1, 50-1, 40-1.
8-ton 36" gauge gasoline locomotive.
10-ton standard gauge Davenport gasoline locomotive.
Easton V-dump car, 36" gauge, 2-yard, end dump.

G. A. UNVERZAGT & SONS
136 COIT STREET, IRVINGTON, N. J.

CRUSHERS

GYRATORY: 42" Gates K. 30" Superior McCully (Like new). 20" Superior McCully. Gates Nos. 12, 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Telsmith Nos. 4, 5, 6 SC, 9 & 16. Also many Austins, Kennedys and Traylors, many sizes.
JAW TYPE: Traylor 60x84, 48x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 18x36, 12x24. Good Roads 1030. Acme 24x10. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 15x36.
REDUC. TYPE: Kennedy Nos. 25, 37 & 49. Telsmith 3-F & 49. Traylor 30" TZ, 8", 10", 12". Super. McCully 6"x10". Newhouse 5, 7 & 10". Symons Cone & Disc Ty. 2' to 4'.
ROLLS: Allis-C. 12½x12, 36x10, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x16, Etc., Etc.
HAMMERMILLS: Williams No. 1, 2, 3, 4, 8, & 9. Jeffrey 36x18 & 36x42. Day Nos. 20 & 40, Etc.
MILLS: Kennedy Ball 4x6, 5x6 & 5x8. Marcy 8x6 & 10x9. Hardinge 6'x3', 8'x30' & 6'x9'. Misc. Tube Mills 5' & 6' x 22'. Sturtevant Ring Roll, Raymonds, Kents, Fuller Lehigh, Etc., Etc.
CRUSHING PLANTS: No. 65 Diamond No. 22 Pioneer 8x24. 1030 Good Roads, 9x40 Austin-Western, 9x36 C.R.

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Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, **Elevators, Excavators,** Generators, Hoists, Kilns, Dragl.nes, Drag Scrapers, Dredges, Drills, Engines, L. comotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. **(I have equipment at many points in the United States and Canada. What you need may be near your plant.)**

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Tel. Un-3-0242

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LORAIN, Model 75, Serial 3194, gasoline, 1 cu. yd. shovel.
NORTHWEST, Model No. 104, Serial 1849, gas crane, 45 ft. boom.
95C BUCYRUS steam shovels on traction wheels with 3½ yard dippers. Rebuilt condition.
MCMYLER steam locomotive crane, Model No. 4, Shop 3427, 50 ft. boom.
1 yd. KIESELER clamshell rehandling bucket. Rebuilt condition.
GYRATORY CRUSHERS 4K Gates—5K Gates—4D Gates—6K-McCulley.

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Dallas, Texas

WANT TO BUY

2500 Ft. Electric or Diesel Air Compressor. Will Consider Several Smaller Units to Total 2500 Ft.

RUSSELL STANHOPE
DARIEN CONN.

WANTED

2—Koehring Dumptors.
Fairleads and ½-yard drag bucket for Insley Shovel.
40-ft. Barber-Greene, 24-inch lattice type, Conveyor Section.
24-in. Conveyor, 100 to 150 ft. center, lattice type.
Rotary Scrubber.

Waldorf, John Ritter Maryland

WANTED

Gyratory crushers, Allis-Chalmers or Telsmith, 24" and 16" openings, working condition, reasonable. Preferably located Central West. Quote best price with all details.

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828 N. Broadway Milwaukee 2, Wis.

WANTED

Large Jaw Crusher from 48x64 to 66x84. State make and lowest cash price.

HARRY T. CAMPBELL SONS' CORP.
TOWSON, MD.

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Sand and Gravel Business located near a large Government Project. This is a money making proposition. Only experienced or responsible operators need apply.

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FOR SALE

Complete equipment of limestone quarry near Duncansville, Pa., going out of business; consisting of kilns, motors, crushers, drills, bins, etc. All in place in quarry. List of machinery furnished on request.

●

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PONTIAC, ILLINOIS

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Ask us for samples and recommendations
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HENRY, VIRGINIA

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WANTED — Experienced concrete block and special products man to take full charge of Product Department of national organization having twenty-five plants. Applicant should be familiar with practical side of block and special products manufacture. **Write Box B-13 c/o Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.**

WANTED—Permanent position open for Superintendent. Complete charge large lime plant located in Southeast. In replying please give complete experience and personal references, enclosing recent photograph, and salary expected. All replies accepted in confidence. Our employees familiar with this advertisement. Address Box B-15, c/o ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago, Ill.

Opening exists in Mexico for qualified cement plant superintendent. In replying please state full experience, references and salary expected. Reply to Box B-16, c/o Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.

Wanted—Men experienced in operating Universal or Quinn concrete pipe machine; for New York and New Jersey territory. Can use several men as pipe makers, welders, etc. Write or apply American Concrete Pipe Company, Union, N. J.

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POSITION WANTED BY GRADUATE Chemical Engineer with 12 years experience in the Cement Industry. Experience has covered Chemical Process Control, Research, Geological Exploration for Raw Materials, Operation and Production of Special Cements, Concrete Service Work. Address Box 996, Care of Rock Products, 309 West Jackson Blvd., Chicago, Ill.

AMERICAN, now located in Allentown, Penna., is available for engagement in the non-metallic industry. Thirty years' experience in North and South America as superintendent and chemical supervisor of Portland Cement, Gypsum and Magnesite plants; management, plant and laboratory research, design and construction of new installations. Highly recommended. Box B-19 c/o Rock Products, 309 W. Jackson Blvd., Chicago, Ill.

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YOU will be surprised how much time can be saved in the spotting and switching of cars by using a Jones car puller. These sturdy, compact units will speed up car handling to the point where they soon pay for themselves in the saving of time and labor.

These car pullers are built by Jones as complete units with motor included if desired, or with base to take standard motor, as supplied by the purchaser. The cable drum is driven by a Jones triple reduction Herringbone speed reducer and the control station may be located at a point to give the operator a clear view of the tracks and spotting positions.

Even in plants where comparatively few cars are handled it has been found that a Jones car puller more than pays its way. Prices and complete information will enable you to judge whether such an outfit might pay out in your plant. Write for complete information.

W. A. JONES FOUNDRY & MACHINE CO.
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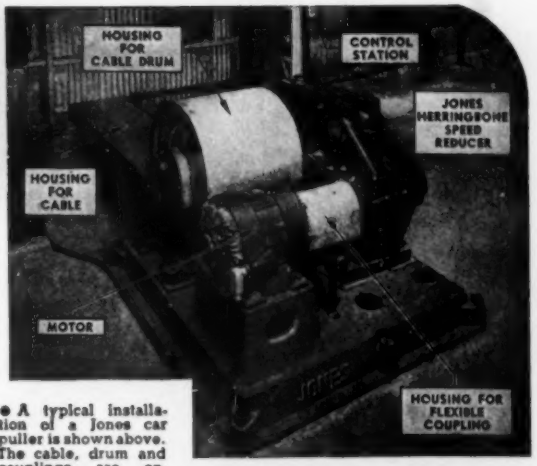

● A typical installation of a Jones car puller is shown above. The cable, drum and couplings are enclosed by sheet metal housings as an extra precaution in this installation to eliminate all hazard from moving parts.

● A complete Jones car puller unit. These outfits are for use with wire rope and are manufactured in a wide range of capacities to suit the number of cars to be handled in each plant.

Jones HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS
CUT AND MOLDED TOOTH GEARS • V BELT SHEAVES
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SIMPLICITY ENGINEERING CO.
DURAND MICHIGAN

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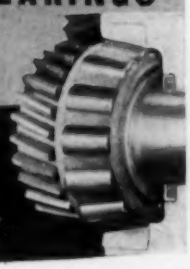

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MILWAUKEE, WISCONSIN, U. S. A.
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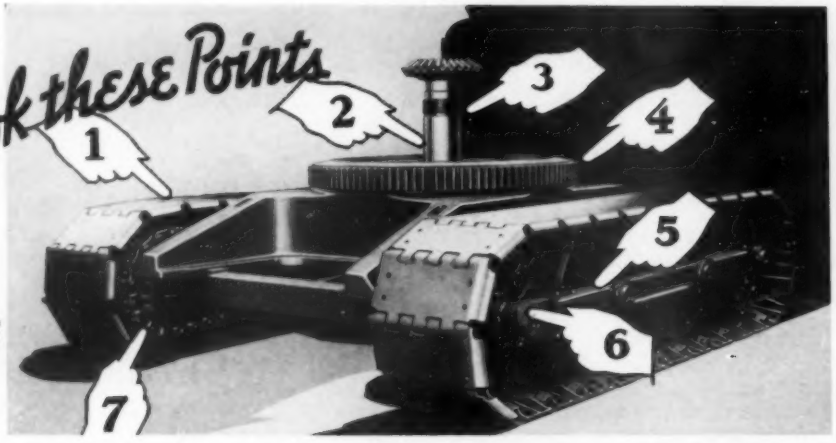

1. Maintain uniform tension on both tracks. Crawler belts should have a minimum of sag except in sand or gravel where more slack is desirable.

2. Lubricate center pin bushing heavily twice each shift. Clean regularly to prevent grease and dirt from collecting around adjusting nut.

3. Center pin adjustment should be carefully maintained. Clearance of rear conical rollers should not exceed 3/16" with machine handling maximum load.

4. Ring Gear—Coat teeth with gear shield regularly. Roller Path—Keep free of excess dirt and grease.

5. Track adjustment is best accomplished on level ground. After adjustment has been made, coat adjusting screws with heavy oil. Dust and dirt corrosion on adjusting screws can be prevented by wrapping them after oil has been applied.

6. Track rollers should be greased at least every eight hours when machine is in use regardless of amount of traveling done. Grease all base fittings at frequent intervals when machine is being traveled. Check grease lines to inner bearings to see that they are not loose or broken.

7. Don't lubricate chains where they come in contact with sand or dirt. Keep adjusting axles at right angles to machine base for best chain and sprocket alignment. Keep chains sufficiently tight. Axle clamps should be kept tight to avoid damage to adjusting screws.

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SHOVEL AND CRANE DIVISION • • • • LIMA, OHIO

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Link-Belt Screens have proved themselves over the years in the effective screening of all types of materials. If you need a good screen — try Link-Belt.

9280

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Official U. S. Navy photograph

Pearl Harbor, Hawaii. Even Date—The 29,000 ton U.S.S. "Oklahoma" is again afloat. During months of preparation by the Pacific Bridge Company, some 50 miles of TRU-LAY Preformed and CRESCENT Non-Preformed wire rope (ranging in diameter from 1" to 3") was shackled to the huge ship, then in less than 69 hours operating time the "battlewagon" was pulled out of her list of 151 degrees back to within 10½ degrees of natural position.

For this spectacular job, a sling or bridle was put over the ship. This bridle was made of 42 lengths (averaging 360') of 3" CRESCENT Non-Preformed rope. Attached to this were 21 reels (10,000' each) of 1" TRU-LAY Preformed wire rope. These were attached to winches ashore, and after less than three days steady pulling, the "Oklahoma" was right side up.

The American Cable Division, not only for this shining example but for its less spectacular day-in and day-out effort, is proud to be numbered among those who are working to speed the war's victorious end.

AMERICAN CABLE DIVISION Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Portland, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC.

BRIDGEPORT, CONNECTICUT

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IS IT THE SHIPPER SHAFT?
IS IT THE FRONT DRUM ASSEMBLY?
IS IT THE REAR DRUM ASSEMBLY?
IS IT THE ENGINE?
IS IT THE BOOM?
IS IT THE DIPPER?
BUCYRUS ERIE
IS IT THE MOUNTING?
IS IT THE VERTICAL PROPEL SHAFT?
IS IT THE FRAME ASSEMBLY?
IS IT THE REVOLVING FRAME?

● It is none of these and it's all of them.

There is no most important part. Every assembly, every smallest unit has its job to do. A loose bolt unattended to, a squealing band ignored, can easily result in complete stoppage of the machine.

That's why intelligent, preventive maintenance is so vitally necessary to keep your excavator digging at top speed all day long, day after day.

Careful inspection should be a regular routine. At least every six shifts (oftener in tough digging) inspect your machine completely. Be sure all nuts and cap-screws are tight.

Follow carefully your manufacturer's recommendations for care and maintenance. Lubricate regularly in accordance with instructions. Use only good lubricants. Keep oil and grease and fittings free from dirt or grit.

Watch the little things. Anticipate troubles; don't wait until they arise. Keep machine clean so you can see trouble start.

Time is precious. Your excavator has important work to do in this war we're fighting. Make sure it is kept in tip top fighting condition by giving it the best possible care constantly.

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